Vol. 991 Number 2

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UNITED STATES PATENT AND TRADEMARK OFFICE

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U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

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Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Board of Appeals Decisions Rendered in the Month of December 1979

Affirmed	143
Affirmed in part	13
Reversed	48
Total	204

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

Re. 29,440, Re. S.N. 093,686, Filed Nov. 13, 1979, Cl. 200/5 A, CALCULATOR KEYBOARD SWITCH WITH DISC SPRING CONTACT AND PRINTED CIRCUIT BOARD, Gilbert H. Durkee, et al., Owner of Record: *Bowmar Instrument Corporation, Ft. Wayne, Ind.,* Attorney or Agent: George A Gust, et al., Ex. Gp.: 217

3,346,272, Re. S.N. 944,544, Filed Sep. 21, 1978, Cl. 280/668, VEHICLE SUSPENSION DEVICE, Charles J. Smith, Owner of Record: *Monroe Auto Equipment Company, wholly-owned subsidiary of Tenneco Inc., Houston, Tex.,* Attorney or Agent: H. Keith Miller, Ex. Gp.: 316

3,526,220, Re. S.N. 099,107, Filed Nov. 30, 1979, Cl. 128/25 B, FOOT EXERCISER, Samuel N. Small, et al., Owner of Record: *World Medical Marketing Co., Central Islip, N.Y.,* Attorney or Agent: Sidney G. Faber, et al., Ex. Gp.: 335

3,608,911, Re. S.N. 098,928, Filed Nov. 30, 1979, Cl. 277/058, RESILIENT PLASTIC PISTON RING, Herbert F. Prasse, et al., Owner of Record: *Ramsey Corporation, St. Louis, Mo.,* Attorney or Agent: Thomas L. Tarolli, et al., Ex. Gp.: 241

3,706,515, Re. S.N. 096,549, Filed Nov. 21, 1979, Cl. 425/4, DEVICE FOR FEEDING FLOWABLE MATERIAL TO A MOLD CAVITY, Rudi Keuerleber, et al., Owner of Record: *Krauss-Maffei Aktiengesellschaft, Munich, Germany,* Attorney or Agent: Karl F. Ross, Ex. Gp.: 147

3,796,330, Re. S.N. 098,478, Filed Nov. 29, 1979, Cl. 414/525, VAN FOR TRANSPORTING COMPRESSIBLE MATERIAL, Charles V. Dehner, Owner of Record: *Inventor,* Attorney or Agent: Gordon D. Schmidt, et al., Ex. Gp.: 314

3,974,894, Re. S.N. 099,209, Filed Nov. 30, 1979, Cl. 182/113, PORTABLE RISER, Jerry A. Wenger, et al., Owner of Record: *Wenger Corporation, Owatonna, Minn.,* Attorney or Agent: Ernest A. Wegner, et al., Ex. Gp.: 354

4,016,403, Re. S.N. 095,803, Filed Nov. 19, 1979, Cl. 219/550, ELECTRICAL HEATING ELEMENT, Lorne A. Best, Owner of Record: *National Element, Inc., Troy, Mich.,* Attorney or Agent: Charles R. Rutherford, et al., Ex. Gp.: 213

4,033,112, Re. S.N. 097,574, Filed Nov. 26, 1979, Cl. 60/39.28 R, FUEL CONTROL FOR GAS TURBINE ENGINE, Robert W. Schuster, Owner of Record: *The Bendix Corporation, South Bend, Ind.,* Attorney or Agent: Leo H. McCormick, Jr., et al., Ex. Gp.: 343

4,062,737, Re. S.N. 097,572, Filed Nov. 26, 1979, Cl. 204/43 R, ELECTRODEPOSITION OF CHROMIUM, Donald J. Barclay, et al., Owner of Record: *International Business Machines Corporation, Armonk, N.Y.,* Attorney or Agent: Gunter A. Hauptman, Ex. Gp.: 114

4,130,944, Re. S.N. 092,659, Filed Nov. 9, 1979, Cl. 34/8, CENTRIFUGAL FLUIDIZED-BED DRYING METHOD AND APPARATUS, Gunther Hultsch, et al., Owner of Record: *Krauss-Maffei Aktiengesellschaft, Munchen, Germany,* Attorney or Agent: Karl F. Ross, Ex. Gp.: 344

Update of Information Concerning the Patent Cooperation Treaty (PCT)

The following topics of interest to applicants and prospective applicants under the Patent Cooperation Treaty appear in this Notice:

Topic 1: Ratification of the Patent Cooperation Treaty (PCT) by Norway, Liechtenstein and Australia.
Topic 2: List of PCT contracting States as of January 1, 1980.
Topic 3: Table of Fees for the processing of PCT International Applications.
Topic 4: Patent Cooperation Treaty documents available.
Topic 5: PCT Information contained in the Consolidated Listing of Official Gazette Notices of January 1, 1980.

TOPIC 1—RATIFICATION OF THE PATENT COOPERATION TREATY BY NORWAY

Norway deposited its instrument of ratification with the International Bureau on October 1, 1979. Liechtenstein deposited its instrument of accession on December 19, 1979 and Australia deposited on December 31, 1979. According to the provisions of PCT Article 63, the Patent Cooperation Treaty came into effect for Norway on January 1, 1980 and will come into effect for Liechtenstein on March 19, 1980 and for Australia on March 31, 1980. The dates from which these States may be designated are listed under Topic 2.

TOPIC 2—LIST OF PCT CONTRACTING STATES AS OF JANUARY 1, 1980.

State	Ratification or Accession	Date of Ratification or Accession	Date From Which State May Be Designated
(1) Central African Empire*	Accession	15 September 1971	01 June 1978
(2) Senegal*	Ratification	08 March 1972	01 June 1978
(3) Madagascar	Ratification	27 March 1972	01 June 1978
(4) Malawi	Accession	16 May 1972	01 June 1978
(5) Cameroon*	Accession	15 March 1973	01 June 1978
(6) Chad*	Accession	12 February 1974	01 June 1978
(7) Togo*	Ratification	28 January 1975	01 June 1978
(8) Gabon*	Accession	06 March 1975	01 June 1978
(9) United States of America	Ratification	26 November 1975	01 June 1978
(10) Germany, Federal Republic of**	Ratification	19 July 1976	01 June 1978
(11) Congo*	Accession	08 August 1977	01 June 1978
(12) Switzerland**	Ratification	14 September 1977	01 June 1978
(13) United Kingdom**	Ratification	24 October 1977	01 June 1978
(14) France**	Ratification	25 November 1977	01 June 1978
(15) Soviet Union	Ratification	29 December 1977	01 June 1978
(16) Brazil	Ratification	09 January 1978	01 June 1978
(17) Luxembourg**	Ratification	31 January 1978	01 June 1978
(18) Sweden**	Ratification	17 February 1978	01 June 1978
(19) Japan	Ratification	01 July 1978	01 Oct. 1978
(20) Denmark	Ratification	01 September 1978	01 Dec. 1978
(21) Austria**	Ratification	23 January 1979	23 Apr. 1979
(22) Monaco	Ratification	22 March 1979	22 June 1979
(23) Netherlands**	Ratification	10 April 1979	10 July 1979
(24) Romania	Accession	24 April 1979	24 July 1979
(25) Norway	Ratification	01 October 1979	01 Jan. 1980
(26) Liechtenstein	Accession	19 December 1979	19 Mar. 1980
(27) Australia	Accession	31 December 1979	31 Mar. 1980

*Members of African Intellectual Property Organization (OAPI) regional patent system. Only regional patent protection is available for OAPI members states. A designation of any state is an indication that all OAPI states have been designated. Note: only one designation fee is due regardless of the number of OAPI member states designated.

**Members of European Patent Convention (EPC) regional patent system. Either national patents or European patents for member States are available through PCT, except for France, for which only European patents are available if PCT is used. If regional protection is desired for one or more States, the indication "regional parent" must follow the designation of the States or States. Note: only one designation fee is due regardless of the number of EPC member states designated.

TOPIC 3—TABLE OF FEES FOR THE PROCESSING OF PCT INTERNATIONAL APPLICATIONS

Fee	*Amount*	*Time Due*
Transmittal Fee	$35.00	Upon filing.
Search Fee	300.00	Upon filing.
Supplemental Search Fee	200.00 per invention.	Within time limit set in notice to applicant.
International Fee:		
(1) Basic Fee:		
First 30 sheets of application	100.00	Upon filing.
Each Sheet over 30	3.50	Upon filing.
(2) Designation Fee:		
For each national patent desired	45.00	12 Months from the priority date, or, if no priority has been claimed, 12 months from the international filing date.
For each regional patent desired	45.00	

NOTE: Fee amounts are subject to change. Changes in the amounts of the fees, and the effective dates of the changed amounts will be published in the OFFICIAL GAZETTE.

TOPIC 4—PATENT COOPERATION TREATY (PCT) DOCUMENTS AVAILABLE

PCT documents are available from two sources: The U.S. Patent and Trademark Office and the World Intellectual Property Organization. As not all documents are available from both sources, please check the listing below for the correct source before submitting an order.

1. Documents Concerning the PCT Available From the United States Patent and Trademark Office:

PCT Document	*Price*
Patent Cooperation Treaty including Regulations (48 pages)	Free
Request forms, including fee calculation sheet (form PCT/ RO/101 and annex, 6 pages). *Note:* the Request form is a necessary part of the international application.	Free
PCT International Application transmittal letter (form PTO–1382).	Free
Declaration form under 37 CFR 1.70 for entering the national stage in the United States of America as a designated office (form PTO–1391).	Free
Transmittal form for use when filing in the United States of America as a designated office (form PTO–1390).	Free

Orders for PCT Documents available from the U.S. Patent and Trademark Office may be placed by mail or by telephone.

Mail Order Address for documents available from the United States Patent and Trademark Office:

Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Telephone Order for documents available from the United States Patents and Trademark Office:

PCT Operations Area
(703) 557-2008

2. Documents Concerning the PCT Available From the World Intellectual Property Organization (WIPO)

PRICES IN U.S. DOLLARS PER COPY, INCLUDING MAILING CHARGES

Note: Prices are subject to change. Changes in prices will be published in the OFFICIAL GAZETTE.

Mode of ordering and paying for documents available from the World Intellectual Property Organization:

Orders should be addressed to:
WIPO—World Intellectual Property Organization,
PCT Division—Fees, Sales and Statistics Section

If by mail:
34, chemin des Colombettes
1211 Geneva 20
Switzerland
If by telex:
22376 WIPO CH
If by telephone:
(41) (22) 99 91 11
(ask for the PCT Division—Fees, Sales & Statistics Section).

	By surface mail	*By airmail*
PCT Published International Application (pamphlet) and Search report	3.50	4.50
PCT Applicant's Guide:		
English edition	37.00	47.00
(Revisions for 1980)	12.50	15.50
PCT (Treaty and Regulations)	4.50	5.50
PCT Gazette:		
Subscription for 1978	50.00	60.00
Subscription for 1979	145.00	155.00
Subscription for 1980	194.00	360.00
Single issues (1978 and/or 1979)	7.00	8.00
Single issues (1980)	8.50	10.00
Administrative Instructions under the Patent Cooperation Treaty (included in the PCT Gazette No. 1)	7.00	8.00
As a separate A4 brochure	4.00	5.00
With its Annexes (all PCT Forms) (previously document PCT/INT/2)	25.00	30.00
Guidelines for Drawings under the Patent Cooperation Treaty (document PCT/INT/7)	First copy free of charge. For each additional copy:	
	0.50	1.00
Guidelines for the Preparation of Abstracts under the Patent Cooperation Treaty (document PCT/INT/9)	First copy free of charge. For each additional copy:	
	0.50	1.00
Records of the Washington Diplomatic Conference (1970)	63.00	76.00

Payments may be effected by check or by transfer to the account of WIPO at the Swiss Credit Bank, 1211 GENEVA 11 (Switzerland). On request, an invoice will be sent.

TOPIC 5—PCT INFORMATION CONTAINED IN THE CONSOLIDATED LISTING OF OFFICIAL GAZETTE NOTICES OF JANUARY 1, 1980.

The following PCT information from past issues of the Official Gazette is contained in the Consolidated Listing of the Official Gazette Notice of January 1, 1980:

Subject matter/topic	*Original Official Gazette Citation*
PCT Implementing Legislation, Public Law 94-131	942 O.G. 177
Rule Promulgation Relating to Implementation of the Patent Cooperation Treaty	970 O.G. 100
Information for Prospective Applicants	970 O.G. 18
Changes to PCT Regulations of April 1978; Administrative Instructions, including Annexes.	
Update of Information concerning the Patent Cooperation Treaty	984 O.G. 2
Increase in International fees; PCT Member States; Changes in PCT Regulations of May 1979; Changes in Administrative Instructions.	
Filing of PCT or EPC Format Applications in Canada	973 O.G. 28
Answers to Questions Frequently Asked About the Patent Cooperation Treaty	976 O.G. 118

Jan. 8, 1980

SIDNEY A. DIAMOND
Commissioner of Patents and Trademarks.

PATENT NOTICES

Certificates of Correction for the Week of Feb. 12, 1980

3,935,959	4,116,295	4,159,573	4,171,438
3,947,810	4,117,144	4,160,718	4,171,824
3,977,485	4,119,792	4,160,777	4,172,043
3,996,355	4,128,966	4,162,915	4,172,419
3,996,454	4,129,936	4,164,578	4,172,427
4,006,943	4,131,737	4,164,793	4,172,737
4,008,691	4,132,551	4,165,293	4,172,901
4,010,026	4,133,685	4,165,432	4,172,945
4,028,675	4,137,897	4,165,661	4,173,042
4,037,745	4,140,072	4,165,851	4,173,053
4,040,095	4,140,959	4,166,016	4,173,110
4,041,768	4,147,049	4,166,539	4,173,693
4,046,900	4,147,835	4,166,684	4,173,835
4,063,265	4,151,104	4,167,437	4,173,977
4,077,481	4,151,663	4,168,580	4,174,096
4,078,825	4,152,443	4,168,918	4,174,179
4,081,831	4,152,659	4,169,708	4,174,277
4,082,172	4,153,726	4,169,800	4,174,363
4,090,055	4,153,916	4,169,802	4,174,414
4,093,597	4,154,963	4,169,947	4,174,424
4,098,670	4,155,715	4,170,092	4,174,906
4,099,899	4,155,855	4,170,251	4,175,064
4,105,845	4,156,957	4,170,419	4,175,124
4,107,006	4,158,019	4,170,782	4,175,694
4,109,772	4,158,058	4,170,956	4,177,057
4,116,173	4,159,200	4,171,343	

Disclaimers

3,956,174.—*Joseph John Palcher,* Santa Ana, Calif. RUBBER AND POLYMER PRESERVATIVE. Patent dated May 11, 1976. Disclaimer filed Dec. 3, 1979, by the assignee, *Foremost-McKesson, Inc.*

Hereby enters this disclaimer to claims 1, 2, 4 and 5 of said patent.

4,056,475.—*Hanslothar Sander, Siegfried Matusch* and *Uwe Hemminghaus,* Braunschweig, Germany. PULP CATCHER. Patent dated Nov. 1, 1977. Disclaimer filed Nov. 28, 1979, by the assignee, *AM International.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

Dedications

3,164,982.—*Raphael A. Pasternak,* San Mateo, *Leonard A. Cavanagh,* San Jose, *Harry C. Ehrmantraut,* Los Altos, and *Bruce D. Marshall,* Palo Alto, Calif. THERMO-ELECTRIC OSMOMETER. Patent dated Jan. 12, 1965. Dedication filed Oct. 29, 1979, by the assignee, *Hewlett-Packard Company.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,195,346.—*Harry C. Ehrmantraut,* Los Altos, *Roderic E. Steele,* Portola Valley and *Wilmer E. Walker,* Sunnyvale, Calif. AUTOMATIC OSMOMETER. Patent dated July 20, 1965. Dedication filed Oct. 29, 1979, by the assignee, *Hewlett-Packard Company.*

Hereby dedicates to the Public the entire remaining term of said patent.

4,135,240.—*Dennis M. Ritchie,* Summit, N.J. PROTECTION OF DATA FILE CONTENTS. Patent dated Jan. 16, 1979. Dedication filed Nov. 28, 1979, by the assignee, *Bell Telephone Laboratories.*

Hereby dedicates to the Public the entire remaining term of said patent.

October–December 1979 Classification Orders

The reclassifications covered by the following classification changes became effective between October and December 1979.

		Class	Subclasses
Classification Order 704, effective October 3, 1979:			
Abolished		324	0.5; 1–29; 29.5; 30–33.
Established		324	300–470.
			Cross-Reference Art Collections.
			800.
Classification Order 705, effective October 9, 1979:			
Abolished		271	63; 64; 172; 173; 174; 80.
Established		271	278–315.
Classification Order 706, effective October 19, 1979:			
Abolished		29	401–403.
Established		29	401.1; 402.01–402.00; 402.11–402.19; 402.21; 403.1–403.4.
Classification Order 707, effective October 29, 1979:			
Abolished		105	241.
Established		105	241.1; 241.2.
Classification Order 708, effective October 30, 1979:			
Abolished		414	142; 524.
		224	924.
Established		414	24.5; 24.6; 695.5–695.8.
Classification Order 709, effective November 5, 1979:			
Abolished		32	All.
Established	(New)	433	1–229.
Classification Order 710, effective November 6, 1979.			
Abolished		96	ALL.
		101	128.2; 128.3; 450; 463.
		156	659; 661.
		204	18.
		250	315–317; 327; 475.
		252	62.1; 501.
		346	1; 135.
		427	14–24; 43; 45; 53; 54; 56.
Established		101	128.21; 450.1; 463.1.
		156	659.1; 661.1.
		204	18.1.
		250	315.1; 315.2; 316.1; 317.1; 327.1; 475.1.
		252	501.1; 600.
		346	1.1; 135.1.
		350	322.
		427	41.1; 43.1; 45.1; 53.1; 54.1; 56.1.
	(New)	430	1–644;
			Cross-Reference Art Collections.
			900–967.
Classification Order 711, effective December 11, 1979:			
Abolished		128	140–147; 172–212; 351; Digest 2.
Established		128	200.11–200.19; 200.21–200.29; 201.11–201.19; 200.21–201.29; 202.11–202.19; 202.21–202.29; 203.11–203.19; 203.21–203.29; 204.11–204.19; 204.21–204.29; 205.11–205.19; 205.21–205.29; 206.11–206.19; 206.21–206.29; 207.11–207.19; 207.21–207.29;
			Cross-Reference Art Collection.
			909.
Title Change(s)		128	665; 738.
Classification Order 712, effective December 18, 1979:			
Abolished		105	366–368; 463–504; 376.
		244	118.
		248	119.
		280	179.
		296	35.
Classification Order 712, effective December 18, 1979:			
Established		244	118.1–118.6.
		296	35.1–35.4.
	(New)	410	1–156.

ALFRED C. MARMOR,
Administrator for Documentation,
January 15, 1980.

Set XIII of Addenda to the Classification Definitions

The definitions of the classes listed below were modified by addenda as part of Classification Orders issued between July and September 30, 1979. All of these addenda have been consolidated into Set XIII of "Addenda to the Classification Definitions."

Class	Class	Class	Class	Class	Class
5	92	175	241	328	427
8	99	180	244	330	428
23	104	181	246	331	432
26	105	182	248	332	435
28	106	188	250	333	520
29	114	192	252	335	Classes:
33	115	193	254	336	(521)
34	116	195	260	340	(525)
35	122	196	261	343	(526)
47	123	201	264	346	(528)
53	126	202	267	350	530-570
56	127	203	280	356	Classes:
57	128	204	289	361	(531)
59	131	206	293	364	(536)
60	134	208	296	366	(544)
62	136	210	303	367	(548)
64	137	217	305	404	(549)
69	156	219	310	415	585
70	162	220	315	422	
71	165	224	318	423	
73	166	237	324	424	
74	172	239	325	426	

The following newly established classes issued between July and October 1979: Classes 367, 435, 525, and 549.

ALFRED C. MARMOR
Administrator for Documentation,
January 15, 1980.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626-7555 Ext. 274
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 12, 1980

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—R. FRIEDMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy: Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-2-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-3-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-14-79
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director. Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	5-3-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-8-79
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-25-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	11-15-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	4-16-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	1-29-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-20-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	2-13-78
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	12-14-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	12-14-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	1-8-79
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	7-24-78
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director. Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Misc. Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	8-17-78

Expiration of patents: The patents within the range of numbers indicated below expire during January 1980, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 82nd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,070,801 to 3,076,194, inclusive
Plant Patents ..... Numbers 2,208 to 2,223, inclusive

REISSUES

FEBRUARY 12, 1980

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,208
DISC BRAKE FOR RAILWAY VEHICLES

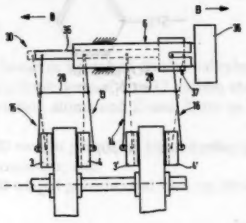
Hans Pollinger; Franz Prahl, and Mathias Schorwerth, all of Munich, Fed. Rep. of Germany, assignors to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

Original No. 4,015,691, dated Apr. 5, 1977, Ser. No. 622,958, Oct. 16, 1975. Application for reissue Apr. 17, 1978, Ser. No. 897,300

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1974, 2449853

Int. Cl.[2] F16D *55/228*

U.S. Cl. 188—59 **11 Claims**



1. A disc brake for a railway vehicle having two brake discs on the axle of a wheel and axle assembly, comprising a pair of brake shoes on opposite faces of each brake disc, means suspending said brake shoes from the frame of the wheel and axle assembly, a pair of brake levers for each brake disc, said brake levers each having one end thereof connected to a said brake shoe and the other ends of said brake levers being remote from said brake shoes, pull-rod means for pivotally connecting each pair of brake levers between the ends thereof, said brake levers defining two outer levers and two inner levers disposed between said outer levers, a displaceably supported brake cylinder having a reciprocable piston rod extending therefrom and said cylinder pivotally connected to the remote end of one of said outer brake levers, the remote end of the other of the outer brake levers being pivotally connected to said piston rod, [and] means for defining a pair of fixed points, said fixed points means comprising a carrier and the remote ends of said two inner brake levers being pivotally connected to said fixed points on said carrier, *and means on said carrier for guiding said piston rod and brake cylinder parallel to the axis of the wheel and axle assembly.*

Re. 30,209
SKID CONTROL SYSTEM

Joseph H. McNinch, Jr.; John A. Urban, both of Livonia, and Gary L. Hopkins, Farmington, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Original No. 3,966,267, dated Jun. 29, 1976, Ser. No. 528,218, Nov. 29, 1974. Continuation of Ser. No. 326,676, Jan. 26, 1973, abandoned. Application for reissue Jun. 23, 1978, Ser. No. 918,670

Int. Cl.[2] B60T *8/02*

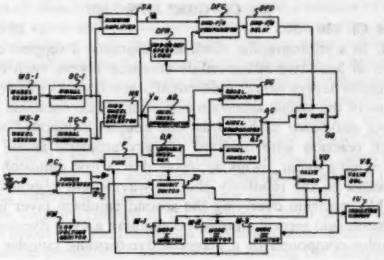
U.S. Cl. 303—106 **9 Claims**

1. A skid control system for use with a vehicle having at least first and second spaced apart independently rotatable wheels and having a braking system for applying braking forces to said wheels and comprising:

brake control means responsive to a skid signal for controlling said braking system to release the braking forces on said wheels;

means for providing first and second wheel speed signals of magnitudes respectively representative of the wheel speeds of said first and second wheels;

logic circuit means for providing a skid signal when the acceleration rate of the faster of said wheels exceeds a predetermined positive acceleration; and



means for inhibiting said logic circuit means from providing said skid signal when the positive acceleration rate of the faster wheel [attains] *exceeds* a level representative of a second predetermined acceleration greater and more positive than that of said first predetermined acceleration.

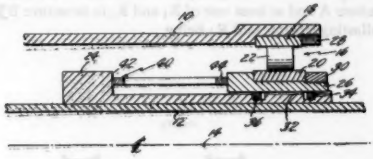
Re. 30,210
DAMPED INTERSHAFT BEARING AND STABILIZER

Dennis F. Buono, East Hartford; Nils G. Carlson, Glastonbury; David H. Hibner, Colchester, and Donald C. Moringiello, Windsor, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Original No. 4,046,430, dated Sep. 6, 1977, Ser. No. 666,530, Mar. 12, 1976. Application for reissue Nov. 22, 1978, Ser. No. 963,072

Int. Cl.[2] F16C *35/08*

U.S. Cl. 308—26 **11 Claims**



1. Damping means for an inner shaft and outer shaft mounted in coaxial relation, bearing means mounted between said inner shaft and said outer shaft, a fluid damper mounted under the bearing and includes an annular groove surrounding at least one of said shafts which is filled with a viscous fluid, radial restraint means mounted on said one of said shafts in parallel with the viscous damper means to impart a load to the other of said shafts to change its critical speed to a value above the maximum rotational speed of said one of said shafts and stabilize the viscous damper.

Re. 30,211
PHOTOGRAPHIC ELEMENTS CONTAINING COLOR-FORMING COUPLERS HAVING AN INHIBITING EFFECT UPON THE REACTIVITY OF COMPETING COUPLERS

Robert G. Cameron, Spencerport, and Dan Neuberger, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

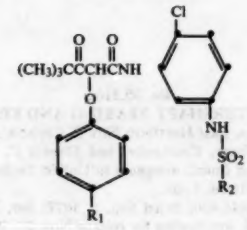
Original No. 3,933,501, dated Jan. 20, 1976, Ser. No. 478,123, Jun. 10, 1974. Continuation-in-part of Ser. No. 419,573, Nov. 28, 1973, abandoned. Application for reissue Jun. 16, 1978, Ser. No. 916,172

Int. Cl.[2] **G03C** *1/76, 1/40*

U.S. Cl. 430—503 **25 Claims**

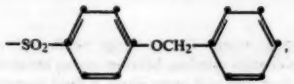
1. In a photographic element comprising a support coated with at least two silver halide emulsion layers; each of said emulsion layers being preferentially sensitive to different regions of the visible spectrum and each of said emulsion layers being associated with at least one coupler compound which, upon reaction with oxidized primary aromatic amine color developing agent, forms an image dye; a first emulsion layer sensitive to the relatively shorter wavelength region of the visible spectrum overlying the second emulsion layer in said element, said second emulsion containing a cyan dye-forming coupler compound or a magenta dye-forming coupler compound;

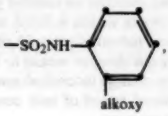
the improvement which comprises, in said element, the presence in said first emulsion layer of a yellow dye-forming coupler compound having a Competitive Reaction Ratio of at most about 1.20; said yellow dye-forming coupler compound being selected from those having [one of] the structure[s]:



wherein R_1, *and* R_2 [and R_3] can differ and are non-interfering coupler substituent groups; at least one of R_1 and R_2 [in structure A and at least one of R_1 and R_3 in structure B] being a ballasting group; said R_1 being

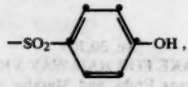
-nitro,

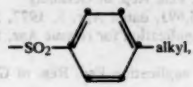


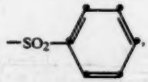


-continued

—$NHSO_2$-alkyl,







—SO_2-alkyl, or
—CN, and

said R_2 being
—C_nH_{2n+1}, where n is 1 to 30;
-alkaryl;
-aralkyl;
-phenyl; or
alkoxyphenyl,

wherein the groups designated as alkyl and alkoxy contain 1–30 carbon atoms and the alkaryl, aralkyl and alkoxyphenyl groups contain 7–35 carbon atoms.

Re. 30,212
COATING AND INK COMPOSITIONS

Charles H. Carder, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

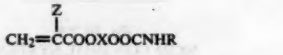
Original No. 4,003,751, dated Jan. 18, 1977, Ser. No. 503,476, Sep. 5, 1974. Application for reissue May 6, 1977, Ser. No. 794,420

Int. Cl.[2] **C09D** *11/00*

U.S. Cl. 106—20 **11 Claims**

1. A coating or ink composition comprising:

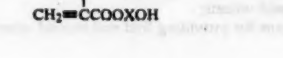
a. from 1 to 80 weight percent of at least one monofunctional acrylate-urethane of the formula:



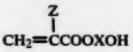
wherein Z is hydrogen or methyl; X is divalent alkylene of 1 to 10 carbon atoms, cycloalkylene of 5 to 12 carbon atoms; and R is alkyl of 1 to 10 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, or aryl of 6 to 12 carbon atoms;

b. from 20 to 99 weight percent of at least one polyfunctional acrylate-urethane of the group:

i. polycaprolactone-polyurethane-polyacrylate oligomers, said oligomers being the reaction product of polycaprolactone polyol having a molecular weight of from 130 to 20,000, organic polyisocyanate and hydroxyl substituted ester of the formula:

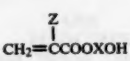


ii. diurethane-diacrylate, said compound being the reaction product of two moles of a hydroxyl substituted ester of the formula:



and one mole of an organic diisocyanate, or,

iii. urea-urethane-polyacrylate oligomer said oligomer being the reaction product of a hydroxyl substituted ester of the formula:



an organic diisocyante and a hydroxylamine of the formula:

wherein R′ is a linear or branched divalent alkylene of 1 to 12 carbon atoms, cycloalkylene of 5 to 12 carbon atoms, or arylene of 6 to 12 carbon atoms and Z and X are as hereinabove defined;

c. from 0 to 50 weight percent of at least one polyfunctional acrylate crosslinker; and

d. from 0 to 30 weight percent of at least one monofunctional acrylate.

Re. 30,213

METHOD OF MAKING FOAMED COPOLYIMIDES AND PRODUCT OBTAINED THEREFROM

John Gagliani, San Diego, and John V. Long, El Cajon, both of Calif., assignors to International Harvester Company, Chicago, Ill.

Original No. 3,966,652, dated Jun. 29, 1976, Ser. No. 522,765, Nov. 11, 1974. Application for reissue Mar. 29, 1979, Ser. No. 25,004

Int. Cl.[2] **C08J** *9/02*

U.S. Cl. 521—185 **7 Claims**

1. A process of making a copolyimide foam which comprises the steps of: dissolving two or more diamines in a mixture of an esterifying agent and one or more esters of a tetracarboxylic acid in an amount such that the imide forming functionalities are substantially equimolar, one of said diamines being heterocyclic and having nitrogen in the ring, another of said diamines being a para- or meta-substituted aromatic diamine which is free of aliphatic moieties, and any additional diamine being either a heterocyclic or an aromatic diamine as aforesaid; adding from 0.1 to 10 parts by weight of a surfactant based on the weight of the ester and diamine constituents; heating the resulting material at a temperature in the range of 150°–250° F. until the volatiles content of the material is from one to five percent lower than the theoretical volatiles content of the ester and diamine constituents; and thereafter heating the unfoamed precursor material existing at the end of said step of reducing the volatiles content to a temperature in the range of 220°–325° F. to develop a polymeric foam and then to a temperature of 550°–600° F. to cure the foam.

PLANT PATENTS

GRANTED FEBRUARY 12, 1980

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,501

PLUM TREE

Frederic W. Anderson, Merced, Calif., assignor to Reedley Nursery, Inc., Reedley, Calif.

Filed Jan. 11, 1979, Ser. No. 2,784

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—38 **1 Claim**

1. A new and distinct variety of plum tree, substantially as illustrated and described, characterized, in comparison to the Cassellman, by late ripening freestone fruit having less red exterior color at harvest but which red color intensifies during shipment and storage.

4,502

CARNATION NAMED DOOKA PINK

Akira Dooka, and Michiko Dooka, both of 1621 Old San Jose Rd., Soquel, Calif. 95073

Filed Aug. 28, 1978, Ser. No. 937,088

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—70 **1 Claim**

1. A new and distinct carnation cultivar substantially as herein shown and described, characterized by its profuse and continuous production of relatively small variegated pink and white flowers on strong, rigid stems.

PLANT PATENTS

CLASSIFIED FEBRUARY 12, 1980

PATENTS

GRANTED FEB. 12, 1980

ERRATA

For CLASS	See PATENT NO.
227–066	4,187,589
101–379	4,187,772
101–001	4,187,774
414–421	4,187,950
416–226	4,188,171
430–022	4,188,216
430–495	4,188,218
430–208	4,188,219
430–536	4,188,220
430–284	4,188,222
430–270	4,188,223
204–159.15	4,188,224
430–007	4,188,225
430–620	4,188,226
435–179	4,188,263
023–230 B	4,188,264
435–313	4,188,265
548–229	4,188,323
548–240	4,188,324
549–087	4,188,327
585–274	4,188,348
525–366	4,188,349
525–187	4,188,352
426–276	4,188,399
028–167	4,188,422
427–040	4,188,426
364–200	4,188,662

PATENTS

GRANTED FEB. 13, 1990

ERRATA

PATENTS

GRANTED FEBRUARY 12, 1980

GENERAL AND MECHANICAL

4,187,557
ATHLETIC GLOVE
Aldo L. Tombari, 2872 Valleyview Dr., Huntington, Ind. 46750
Filed Apr. 10, 1978, Ser. No. 895,269
Int. Cl.[2] A41D *19/00*; A63B *71/14*
U.S. Cl. 2—19 **10 Claims**

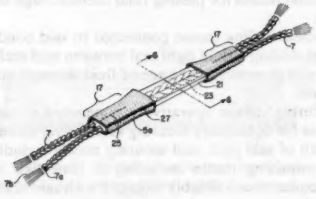
1. An athletic glove adapted to be used by baseball batters or the like, and characterized by the ability to improve the leverage imparted to the bat by the hands, to thereby improve directional control and obtain greater swing velocity, and comprising

a body portion adapted to overlie at least a portion of the palm of a wearer's hand,

at least two tubular finger portions attached to said body portion and adapted to respectively receive the third and fourth fingers of the wearer's hand, and having a length sufficient to overlie the second phalange of each such finger, and

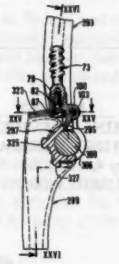
a single pad mounted to the inside of each of said two finger portions, with each of said pads positioned to overlie only the second phalange of the respective fingers and with the remainder of said finger portions being free of any pad, said pads each having a thickness sufficient to enable the third and fourth fingers to significantly increase the force which they are able to apply to a bat.

4,187,558
PROSTHETIC LIGAMENT
Burton L. Dahlen, Cardiff-by-the-Sea, and James A. Stubstad, Lafayette, both of Calif., assignors to Cutter Laboratories, Inc., Berkeley, Calif.
Filed Oct. 25, 1977, Ser. No. 844,678
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1 **9 Claims**



1. A surgically implantable skeletal ligament comprising an elongated flexible body having two end portions and having secured thereto between the end portions at least one collar member, the collar member being a deformable material having two major surfaces, an inner surface in intimate contact with the ligament body and an opposite outer velour-like surface adapted to invite tissue ingrowth when the collar of the ligament is implanted within a living bore, the collar member including a deformable flared mouth portion continuous with and extending from the collar member and adapted to loosely receive a portion of the ligament body prior to its intimate contact with and attachment to the collar member.

4,187,559
BODY JOINT ENDOPROSTHESIS
Helmut Grell, Aalen, and Achim Engelhardt, Frankfurt, both of Fed. Rep. of Germany, assignors to Sybron Corporation, Rochester, N.Y.
Continuation of Ser. No. 672,963, Apr. 2, 1976, abandoned. This application Jun. 12, 1978, Ser. No. 914,738
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1975, 2514793
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.91 **32 Claims**



1. A body joint endoprosthesis comprising:

an anchoring part comprising a shaft adapted to be anchored in a first bone;

a pivot member comprising a first joint member and a support element adapted to bear against a seating surface of the first bone, said pivot member being connected to said anchoring part by a joint that permits said support element to pivot in a direction substantially normal to said seating surface; and

a second joint member adapted to be connected to a second bone, with said first joint member and said second joint member forming a body implant joint.

4,187,560
Patent Not Issued For This Number

4,187,561
TOILET RISER

David B. Bogan, 7303 Paso Robles Ave., Van Nuys, Calif. 91406

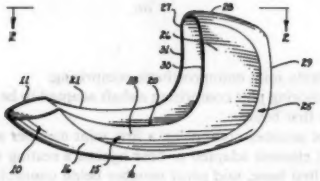
Filed Aug. 4, 1978, Ser. No. 931,184
Int. Cl.[2] A47K *11/02*
U.S. Cl. 4—116 2 Claims

1. A toilet riser comprising:
an open-ended, hollow body of integral, unitary construction;
said body having a straight walled base or lower portion and a tapered walled upper portion;
an outwardly projecting flange integrally provided at the juncture of said lower and said upper portion;
an inwardly extending lip integrally formed at the termination end of said upper portion defining a central opening leading into the hollow interior of said body;
side wall reinforcement means vertically provided on opposite sides of said lower portion;
a splash panel integrally formed beneath said lip at the rear of said upper portion;
said body is characterized as being fabricated by seamless molded techniques and the composition of said body is cross-linked polyethylene; and
said body includes a hinge support portion integrally formed with and adjacent to said lip at the rear of said body.

4,187,562
PERSONAL URINAL DEVICE FOR FEMALES

Victoria F. Mioduski, 1226 N. Torino Ave., Tucson, Ariz. 85712

Filed May 4, 1978, Ser. No. 902,888
Int. Cl.[2] A61G *9/00;* A47K *11/12*
U.S. Cl. 4—144.3 8 Claims

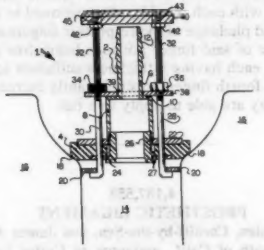


1. A semi-rigid personal urinal for collecting urine from women, said urinal being useable by a woman while she is in a sitting or supine position by placing said urinal upon the same surface supporting the user, said urinal comprising in combination:
(a) a receiving end for receiving urine discharged from the orifice of the urethra, said receiving end including a lip for sealingly engaging a part of the labium;
(b) a central section continuous with said receiving end and having a longitudinal axis and extending longitudinally from said receiving end for channeling the urine away from said lip, said central section being of sufficient capacity to receive and retain a substantial part of the discharged urine, said central section including opposed walls having concave wall sections for contactingly engaging at least the lower part of the adjacent portions of the user's thighs and through such engagement constraining movement of said urinal relative to the user's thighs and urethra;
(c) a container disposed downstream of and continuous with said central section, said container being configured to store the collected urine upon rotation of said urinal from a horizontal position to a vertical position, said container including an upright portion extending vertically from the longitudinal axis of said central section for a distance sufficient to place the upper end of said upright section above the mid point of the user's thighs when said urinal is in use, said upright portion including further wall sections extending from said wall sections of said central section for engaging the adjacent surfaces of the user's thighs, said further wall sections including concave sections for contactingly receiving at least the mid points of the user's thighs and constraining vertical and horizontal movement of said urinal with respect to the user's thighs;
whereby, said urinal is maintained in place by contact with the user's thighs and is accessible by the upper end of said upright portion before, during and after use.

4,187,563
FLUSHING DEVICE

Victor Semke, 10617 Chamonieux Dr., Palos Hills, Ill. 60465

Filed Jul. 24, 1978, Ser. No. 927,009
Int. Cl.[2] E03C *1/306;* F16L *5/02*
U.S. Cl. 4—256 12 Claims



1. A device for flushing a drain pipe having an anchor point by applying fluid under pressure to the interior of the pipe, said device comprising:
(a) conduit means for passing fluid therethrough under pressure;
(b) resilient sealing means connected to said conduit means for providing a fluid tight seal between said sealing means and said pipe during passage of fluid through said conduit means;
(c) securing means operatively connected to said sealing means for detachably securing said sealing means over the mouth of said pipe, said securing means including
(i) restraining means including at least two restraining members each slidably engaged with said sealing means and having an anchoring portion engageable with said anchor point; and
(ii) urging means operatively connected to said restraining member and said sealing means for urging said anchoring portions of said restraining member against said

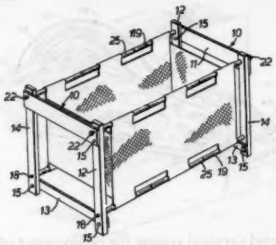
anchor point simultaneously with urging said sealing means into sealing engagement with said pipe to create said seal; and

(d) disengagement prevention means including an apertured transverse locking member engageable with and interconnecting said restraining members at a point between said urging means and the end of said restraining members opposite from said anchoring portions for preventing rotation and disengagement of said restraining means from said anchor point when said sealing means is brought into sealing engagement with said pipe.

4,187,564
INFANTS COT

Antonio D. Alomar, Paseo Maritimo 12, Edificio Bellver, Palma de Mallorca, Balearic Islands, Spain

Filed Mar. 28, 1978, Ser. No. 890,870
Claims priority, application Spain, Apr. 4, 1977, 227.650[U]
Int. Cl.[2] A47D *7/04*
U.S. Cl. 5—94 **7 Claims**

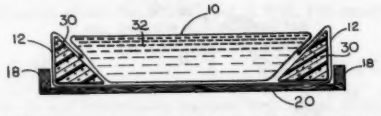


1. A frame assembly for an infant's cot, including a pair of end frames, each having four members pivotally interconnected by three joints and being foldable from a first substantially rectangular configuration to a second configuration in which the members are in substantially superimposed alignment, and bracing members for interconnection said pair of end frames, said pair of end frame members being secured in said first configuration by engagement with two of said bracing members.

4,187,565
WATERBED CONSTRUCTION

Lee B. Zeltzer, 3145 Camino Juan Paisano, Tucson, Ariz. 85718

Filed Dec. 5, 1977, Ser. No. 857,470
Int. Cl.[2] A47C *27/08*
U.S. Cl. 5—451 **10 Claims**

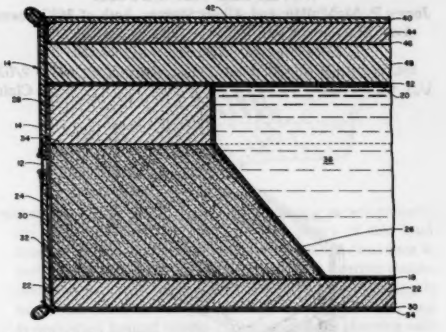


1. Improvements in waterbed construction having lower platform support and water filled mattress thereupon, said improvements comprising side means juxtaposed in touching relationship the outside perimeter of the sides of the water mattress, and waterproof liner means interposed the water mattress and lower platform support, said liner means additionally partially enclosing said side means.

4,187,566
WATER MATTRESS CONSTRUCTION

Warren E. Peterson, Santa Ana, Calif., assignor to Wilshire Bedding Co., Inc., Los Angeles, Calif.

Filed Feb. 8, 1978, Ser. No. 876,073
Int. Cl.[2] A47C *27/08*
U.S. Cl. 5—451 **26 Claims**



1. A fluid cell mattress construction comprising:

a rectangular layer of low-density elastomeric foam;

an intermediate rectangular layer of medium-density elastomeric foam on top of said low-density foam forming a cavity;

a rectangular layer of low-density elastomeric foam around the perimeter of said cavity on top of said medium-density foam;

a rectangular cover of substantially non-stretchable fabric covering the bottom and sides formed by the three layers of foam, thereby forming the foam layers into a self-supporting frame;

a fluid bladder formed to fit into said cavity;

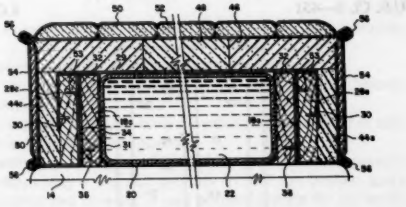
a second layer of low-density foam covering the top of said layers of foam and said bladder; and

a cover of ticking enclosing the assembly of layers of foam and said bladder.

4,187,567
WATERBED

Curt P. Crowther, 663 S. 13th East, Salt Lake City, Utah 84112

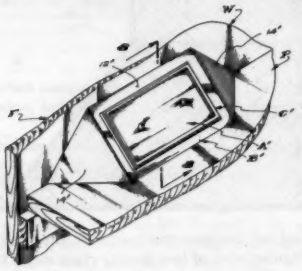
Filed Aug. 4, 1978, Ser. No. 930,921
Int. Cl.[2] A47C *27/08*
U.S. Cl. 5—451 **6 Claims**



1. A waterbed comprising an inner rigid frame member having a rigidity and flexibility equivalent to wood for circumscribing and laterally supporting a liquid containing bladder and removable cushioned cover unit having outer rigid side walls having a rigidity and flexibility equivalent to wood and flexible top member for covering said bladder a flexible bottom wall member which follows the contours of the inner surface of the inner rigid frame member and is fastened to the outer surface of said rigid frame member, wherein the rigidity and

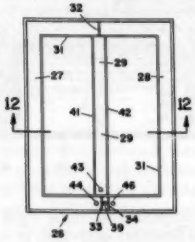
flexibility of said inner and outer rigid side walls are such that the outer surface of said inner side walls will exert a slight force against the inner surface of said outer side walls and flexible member to provide an interlocking and sealing effect when in use.

4,187,568
WATER BED TRANSDUCER
James P. McMullan, and Albert Stevens, both of 2630 Seaman Ave., El Monte, Calif. 91733
Filed May 15, 1978, Ser. No. 906,240
Int. Cl.[2] A47C *27/08;* A61G *7/04;* A61H *1/00;* A47D *9/02*
U.S. Cl. 5—451 **6 Claims**



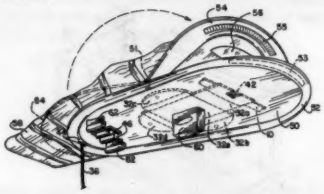
1. In combination, a water bed structure including a frame with at least one vertical side wall, a horizontal platform within the frame and a water filled bladder mattress contained within the frame adjacent said side wall and supported on the platform, a transducer unit including an elongate body arranged in a portion of the corner defined by the platform and said wall and having an outer side engaged with said wall, a bottom side engaged with said platform and an upwardly and inwardly disposed inner side opposing the mattress, a plate positioned between the mattress and the inner side of the body and supporting the portion of the mattress adjacent the unit, resilient coupling means coupling the plate with the body for limited relative movement therebetween and an electro-magnetic vibrator fixed to said plate and projecting freely into the body.

4,187,569
WATER MATTRESS CONSTRUCTION
Dave Calleance, 1945 23rd Ave., San Francisco, Calif. 94116
Continuation-in-part of Ser. No. 761,499, Jan. 21, 1977, Pat. No. 4,080,676. This application Mar. 6, 1978, Ser. No. 883,523
Int. Cl.[2] A47C *27/08, 17/14*
U.S. Cl. 5—451 **4 Claims**



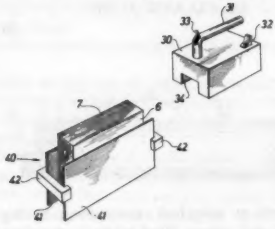
1. A unitary water mattress construction, comprising three web portions in vertically stacked relationship, said web portions being parallel and substantially similar in size and shape; a continuous edge weld joining the outer edges of said web portions in sealing fashion; a second, continuous weld spaced inwardly from said edge weld, joining the upper and medial ones of said web portions in sealing fashion; third and fourth welds extending between said edge weld and said second weld joining said upper and medial ones of said web portions in sealing fashion; said mattress including a water chamber defined by said medial and the lower web portions and said edge weld; and a pair of peripheral upper air chambers defined by said upper and medial web portions, said edge weld, said second weld, and said third and fourth welds and sealed from each other by said third and fourth welds; a water valve extending through said upper and medial web portions to said water chamber; and a pair of air valves extending through said upper web portion to said pair of peripheral upper air chambers.

4,187,570
SHIP ESCAPE AND SURVIVAL SYSTEM
David N. De Simone, Cornwells Heights, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Feb. 17, 1978, Ser. No. 878,556
Int. Cl.[2] B63C *9/00*
U.S. Cl. 9—14 **17 Claims**



1. A personnel survival system for deployment of an individual from a platform above water, comprising:
a harness formed to fit about the torso of the individual;
descent means connected to said harness for lowering the individual from the platform to the water; and
flotation means connected to said harness and including a raft having two inflatable cells angularly connected so that said cells urge against each other when inflated for sealingly encapsulating the individual during the lowering.

4,187,571
MANUALLY MOVABLE BINDING APPARATUS
Ulf J. E. Asterö, Tumba, Sweden, assignor to Asthausbolagen HB Asterö & Stockhaus, Tumba, Sweden
Filed Jun. 23, 1978, Ser. No. 918,511
Claims priority, application Sweden, Jun. 27, 1977, 7707406
Int. Cl.[2] B42C *9/02*
U.S. Cl. 11—1 AD **8 Claims**



1. In an apparatus for binding bundles of paper, comprising means for holding a bundle of paper as a unit, and a binding means comprising a band folding means for attaching a band

provided with a binder to an edge of the bundle, the band folding means being divided into a press means acting on the bundle edge and, in series therewith, a pair of band folders facing each other and acting on the bundle rims adjacent the bundle edge; the improvement wherein: the bundle holding means is a stationary apparatus and the binding means is mounted in a housing adapted to be manually moved along the upper edge of the bundle; further wherein the press means is a press plate which is spring urged toward the upper edge of the bundle and both of the band folders acting on the upper rims of the bundle are spring urged toward each other so as to accommodate for varying bundle thicknesses.

4,187,572

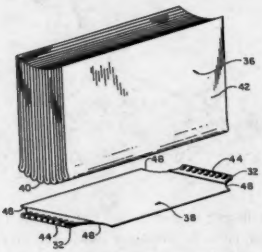
METHOD FOR MAKING INTEGRATED BOOK LINING

Peter P. Savich, Longmeadow, Mass., assignor to The Smyth Manufacturing Company, Bloomfield, Conn.

Continuation-in-part of Ser. No. 785,964, Apr. 8, 1977, abandoned. This application Mar. 6, 1978, Ser. No. 883,728

Int. Cl.[2] B42C *15/00*

U.S. Cl. 11—2 **32 Claims**



1. A method of making integrated book spine linings to be applied to spines of a succession of books and comprising the steps of providing a supply of strip lining material having a crosswise dimension between opposite longitudinal side edges generally corresponding to the book spine length, feeding a strip from the supply of lining material, printing simulated headbands on an outer surface of the strip adjacent its longitudinal side edges, folding the longitudinal side edges of the strip toward one another to expose the outer surface of the strip with the folded crosswise strip dimension between its opposite longitudinal side edges being substantially equal to the book spine length, and cutting the strip transversely to its longitudinal axis to form a succession of individual linings to be applied in registered relation respectively to spines of a corresponding succession of books.

4,187,573

HIGH LOAD BEARING FOR BRIDGES AND SIMILAR STRUCTURES

Edward R. Fyfe, Burlington, Canada, and Stewart C. Watson, Williamsville, N.Y., assignors to Watson Bowman Associates, Inc., Buffalo, N.Y.

Continuation of Ser. No. 812,477, Jul. 5, 1977. This application Jun. 26, 1978, Ser. No. 919,390

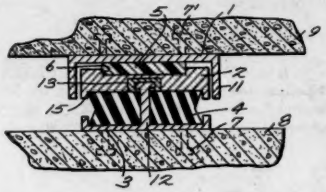
Int. Cl.[2] E01D *19/06*

U.S. Cl. 14—16.1 **5 Claims**

1. In a high load bearing comprising upper and lower plates which do not substantially increase their lateral dimensions under load, a load bearing elastomer pad

on the upper surface of said lower plate and the lower surface of said upper plate being on the upper surface of said bearing pad, said elastomer pad having a groove extending around its periphery and a cooperating bearing member constructed and arranged to substantially prevent shearing movement between said plates and thereby substantially prevent shearing of said elastomer pad but permitting rotational movement between said plates,

the improvement comprising means mechanically abutting said load bearing elastomer pad to at least limit lateral expansion of the upper and lower surfaces of said elastomer pad under load without preventing bulging of said periphery,



said mechanically abutting means comprising means projecting from said plates adjacent the periphery of said load bearing elastomer pad, and in which a lateral clearance is provided between said surface of said load bearing elastomer pad and said projecting means when said bearing is not under load, whereby said load bearing elastomer pad is permitted limited lateral expansion before abutting said projecting means.

4,187,574

CONTACT LENS CLEANSING APPARATUS

Richard J. Wrue, Greece, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Jul. 27, 1978, Ser. No. 928,751

Int. Cl.[2] B08B *11/02*

U.S. Cl. 15—104.92 **11 Claims**

1. An apparatus for the cleansing of contact lens, comprising:

housing means for containing a contact lens;

said housing means including a top portion and a bottom portion;

said top portion being both movable and removable in relation to said bottom portion;

scrubbing pad means within said top and bottom portions comprising a top pad member in said top portion and a bottom pad member in said bottom portion for the scrubbing of said contact lens when said top portion of said housing is joined to and rotated in relation to said bottom portion of said housing means;

said housing means further including a circular shoulder member within said top portion and a circular rim member within said bottom portion, said rim member supporting said shoulder member when said top and bottom portions are joined so as to precisely position said top pad means in relation to said bottom pad means and to facilitate back and forth rotation of said top pad means in relation to said

bottom pad means whereby a consistent force between said top and bottom pad means and scrubbing action on a contact lens contained therebetween may be effected without damage to said contact lens;

said scrubbing pad means further comprising a cellular non-shredding plastic foam material of such a consistency as to safely scrub a contact lens without damaging said lens while at the same time being of sufficient stiffness to effectively scrub said lens.

4,187,575

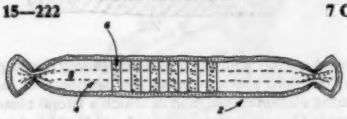
BACK WASH-MASSAGE-SCRUBBER

Robert Collins, 144 Shaw St., Garfield, N.J. 07026

Continuation-in-part of Ser. No. 866,250, Jan. 3, 1976, abandoned. This application Oct. 4, 1978, Ser. No. 948,467

Int. Cl.[2] A47K *7/02*

U.S. Cl. 15—222 **7 Claims**



1. A combination hand washer and back scrubber, comprising:

an elongated strip of fabric, having two lateral edges;

transverse, expansible scrubber strips comprising transverse, expansible soap-and-water retaining strips and transverse abrasive strips, attached to a first side of said fabric strip, each of said transverse strips extending substantially the entire width of said fabric strip;

a water absorbent strip attached to an opposite second side of said fabric strip, said water absorbent strip being non-abrasive to skin; and

a transverse elastic hand strap of an elongated dimension attached at its opposite ends to said respective lateral edges on said fabric strip at approximately the midpoints thereof to form a loop for retaining said fabric strip in a folded position and for allowing the hand of a person to fit within said loop to use said combination hand washer and back scrubber as a wash cloth.

4,187,576

WIPER BLADE

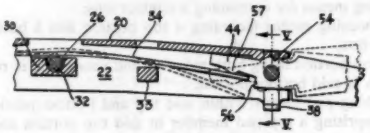
Raymond A. Deibel, West Falls; Neil A. Gowans, Buffalo, and William C. Riester, Williamsville, all of N.Y., assignors to Trico Products Corporation, Buffalo, N.Y.

Continuation of Ser. No. 860,669, Dec. 15, 1977, Pat. No. 4,127,912. This application Dec. 1, 1978, Ser. No. 965,496

The portion of the term of this patent subsequent to Aug. 8, 1992, has been disclaimed.

Int. Cl.[2] B60S *1/04, 1/38*

U.S. Cl. 15—250.42 **3 Claims**



1. In a windshield wiper blade assembly including a pressure distributing superstructure having a transverse receptor for pivotally receiving a wiper arm connecting pin, the pin having a circumferential recess forming a pair of opposed radially extending shoulders, said superstructure includes a spring positioned to span and chordally intersect said transverse receptor, means to bias said spring to a position wherein an intermediate portion is positioned to lie in said recess between said opposed shoulders for retaining said pin in said receptor; characterized in that a fulcrum means is disposed intermediate said receptor and one end portion of said spring, said fulcrum having its axis lying parallel to the axis of said transverse receptor and externally accessible means for applying a force at said one end portion of said spring in a direction against said fulcrum whereby application of such force effects movement of said intermediate portion of said spring to a position out of engagement with the circumferential recess and opposed shoulders to permit removal of said pin from said receptor.

4,187,577

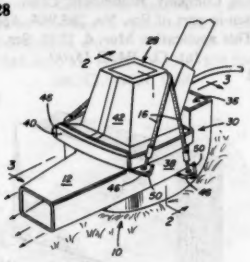
BLOWER ATTACHMENT FOR LINE TRIMMER

Lee A. Hansen, and William A. Conrad, both of 712 N. Piedra, Sanger, Calif. 93657

Filed Aug. 23, 1978, Ser. No. 936,182

Int. Cl.[2] A47L *9/00*

U.S. Cl. 15—328 **4 Claims**



1. An attachment apparatus for converting a portable hand held power apparatus having a head and drive shaft into a blower, comprising: an impeller; a housing for enclosing said impeller and a portion of the head, said housing comprising an impeller chamber surrounding said impeller, an intake port having a first vertically disposed portion opening to the surrounding atmosphere at its uppermost end and leading to a second intake portion at its lower end, said second portion having a covered bottom and covered sides and including a top having an aperture leading to said impeller chamber; and an outlet port connected to said impeller chamber and extending laterally from said impeller chamber in a substantially coplanar relation thereto and an attachment means for maintaining the housing in position upon the head.

4,187,578

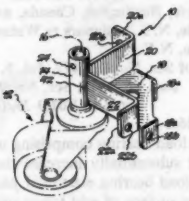
CASTER BRACKET AND METHOD OF FORMING SAME

Carl H. Little, Jamestown, N.Y., assignor to Weber-Knapp Company, Jamestown, N.Y.

Filed Jun. 16, 1978, Ser. No. 916,132

Int. Cl.[2] B60B *33/00*

U.S. Cl. 16—29 **3 Claims**



1. In a caster bracket of the type having a tubular means sized to receive a mounting stud of a caster assembly and plate means for attaching said tubular means to a piece of furniture, the improvement permitting the forming of said tubular means

and said plate means from a single metal plate, said improvement comprising:

said plate means includes a pair of side plates formed integrally with and arranged to upstand from one surface of a connecting plate along adjacent side edges thereof, said side plates having end edges disposed relatively adjacent one another, said tubular means is a curl formed integrally with and as an extension of one of said side plates along its one of said end edges, said curl having a free marginal edge disposed parallel to and immediately adjacent said one of said end edges of said one of said side plates, said free marginal edge is bonded to said one of said side plates, said curl is lengthwise bisected by each of said side plates, and said curl is bonded to the other of said side plates along its one of said end edges.

4,187,579

ADJUSTABLE HINGE FOR MOTOR-VEHICLE SEAT

Walter Gensicke, Rockenhausen, Fed. Rep. of Germany, assignor to Keiper Automobiltechnik GmbH & Co KG, Remscheid-Hasten, Fed. Rep. of Germany

Filed Dec. 21, 1977, Ser. No. 862,821

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 7640079

Int. Cl.² E05D *11/10*

U.S. Cl. 16—139 **10 Claims**

1. An adjustable hinge for interconnecting the back part and the seat part of a motor-vehicle seat, said hinge comprising:

a first hinge element connected to one of said parts;

an array of outwardly directed outer teeth centered on a first axis and fixed on said first element;

a disk fixed to said first element adjacent said array of outer teeth and having a circular outer edge surface centered on said first axis;

a second hinge element connected to the other of said parts and having a recess with a circular inner edge surface aligned radially with said edge surface of said disk and centered on a second axis spaced from and substantially parallel to said first axis, said second hinge element having in radial alignment with said array of outer teeth an array of inwardly directed inner teeth centered on said second axis, said outer and inner teeth having tooth depths equal at least to the spacing between said axes;

an eccentric ring having a circular outer periphery juxtaposed with said inner edge surface and centered on said second axis and an inner periphery juxtaposed with said outer edge surface and centered on said first axis; and

means including a handle connected to said ring for rotating same about said second axis and thereby orbiting said first axis about said second axis while simultaneously rolling said array of outer teeth in said array of inner teeth and thereby changing the inclination between said parts.

4,187,580

OVER-CENTER HINGE

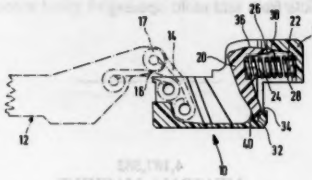
Karl Lautenschläger, Jr., Reinheim, Fed. Rep. of Germany, assignor to Karl Lautenschlager KG Mobelbeschlagfabrik, Reinheim, Fed. Rep. of Germany

Filed Feb. 26, 1979, Ser. No. 15,155

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1978, 2812459

Int. Cl.² E05D *11/10*

U.S. Cl. 16—145 **3 Claims**



1. A hinge for a furniture door, having a door-related hinge part in the form of a cup-like element for mounting in a recess in a door, said element having a bottom portion with a pocket, and a wall portion spaced from said bottom portion, a knuckle mounted in said element for pivoting by a given angular amount, a compression spring acting on said knuckle, a bearing surface provided on said element, said knuckle being movable through a dead-center position on one side of which it urges the door to a closed position and on the other side of which it exerts a pressure in the direction of opening said door, said knuckle having one end in the form of a relatively narrow edge, said edge being inserted in said pocket so as to form a fulcrum, the other end of said knuckle being remote from said one end and defining approximately an arc of a circle whose center coincides approximately with the fulcrum of the knuckle, said knuckle being secured against escape from the fulcrum pocket by said wall portion of said cup-like element, said wall portion closely overarching said other end in every position of movement of said knuckle.

4,187,581

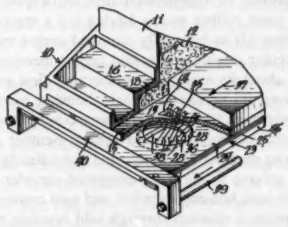
MOLDING DEVICE

Richard C. Wagner, Frankfort, Ill., assignor to Hollymatic Corporation, Park Forest, Ill.

Filed Apr. 17, 1978, Ser. No. 897,292

Int. Cl.² A22C *7/00*

U.S. Cl. 17—32 **12 Claims**



1. A device for molding food articles of raw finely divided beef and similar tissue containing food material that is normally subject to uneven shrinkage during cooking, comprising; supply means for said material; a mold comprising superimposed mold plates each having an opening each with a peripheral edge with the edges of said plate openings being adapted to be aligned to define a mold opening comprising a said article forming cavity said plate openings being of the same shape and

size; a supply passage means for supplying pressurized said material to said plate openings when said mold is in a mold filling position with said plate opening edges out of alignment thereby providing a flow passage means comprising the edge portion of one plate opening and the adjacent surface of the other plate for projecting said food material into the non-aligned openings to fill substantially completely said plate openings with said pressurized material; means for moving said plate openings into edge alignment to comprise said mold opening; and means for moving said aligned plates to an exterior position preparatory to removing the resulting molded food article from said mold opening.

4,187,582

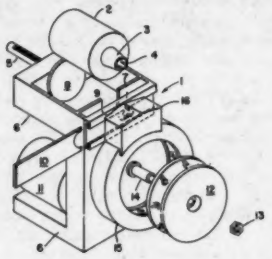
MEATBALL MACHINE

Lohret J. DiLoreto, 268 Parkview Ter., Oakland, Calif. 94610

Filed Jan. 10, 1978, Ser. No. 868,454

Int. Cl.[2] A22C *7/00*

U.S. Cl. 17—32 **7 Claims**



1. An apparatus for making meatballs which comprises:

(a) a meat compaction means for compressing ground meat used in making meatballs under a pressure of 0.5 to 6 psi and forcing the compressed meat through an orifice positioned at one end of said compaction means, said orifice having a diameter from about 0.4 to 1 times the diameter of the meatball,

(b) a meat rolling means connected to said meat compaction means for receiving the compressed meat from said orifice and rolling the compressed meat into a spherical meatball; said meat rolling means having (1) a stationary housing member (2) an internally mounted center member having a circular cross-section, said center member being rotatable about its axis, (3) semi-circular first groove around the internal perimeter of said housing member adjacent said member, (4) a semi-circular second groove around the external perimeter of said center member adjacent said housing member and positioned immediately opposite said first groove to form an elongated circular chamber between said housing member and said center member, (5) an entrance channel through said housing member communicating with said elongated circular chamber, and (6) an exit channel through said housing member communicating with said elongated circular chamber;

whereby the ground meat is compressed in said meat compaction means, extruded through said orifice, falls through said entrance channel into said elongated circular chamber of the meat rolling means, rolled between the stationary housing member and the rotating center member into a spherical meatball and recovered through said exit channel.

4,187,583

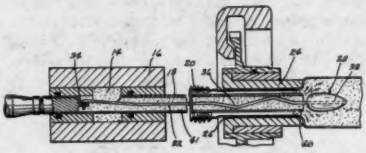
METHOD AND MEANS FOR ENCASING SAUSAGE OR THE LIKE

Ray T. Townsend, and David W. Smith, both of Des Moines, Iowa, assignors to Townsend Engineering Company, Des Moines, Iowa

Continuation of Ser. No. 730,669, Oct. 7, 1976, abandoned. This application Sep. 5, 1978, Ser. No. 939,786

Int. Cl.[2] A22C *11/10, 11/02*

U.S. Cl. 17—49 **7 Claims**



1. The method of creating a link in a meat product being extruded from the discharge end of a stuffing tube into a casing comprising the steps of:

extruding a quantity of meat product from the discharge end of a stuffing tube into an elongated casing,

applying at least some rotational torque to the meat product from within the extruded meat product at an exterior location beyond the discharge end of said stuffing tube whereby the meat product and casing will have rotational torque applied thereto to form a link.

3. In combination,

an emulsion encasing apparatus including a stuffing tube having a discharge end, said stuffing tube adapted to have a folded casing positioned thereon,

a restrictor means mounted on said apparatus and having a restrictor element comprising an elongated wire coil extending outwardly from the discharge end of said stuffing tube, said elongated wire coil being adapted to deform a column of emulsion extruded from the discharge end of said stuffing tube at an exterior location beyond said discharge end, and to impart rotational torque to such extruded emulsion and to the casing engaged by such extruded emulsion.

4,187,584

METHOD AND APPARATUS FOR OPENING TEXTILE FIBER BALES

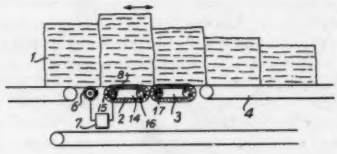
Hermann Trützschler, Mönchen-Gladbach, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Mönchen-Gladbach, Fed. Rep. of Germany

Filed Aug. 10, 1978, Ser. No. 932,502

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1977, 2737434; Sep. 17, 1977, 2742016

Int. Cl.[2] D01G *7/06*

U.S. Cl. 19—81 **7 Claims**



1. A process for opening of textile fiber bales, by which a row of bales are loosened on their undersides and separated, said process employing rotary pairs of needle tables having needles, whereby the rotational speed of said needle tables is varied, said process comprising the steps of: altering the rotary

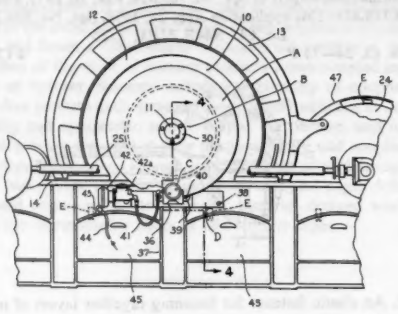
speed of at least one pair of needle tables temporarily in response to textile fiber bale hardness characteristics, and varying said speed from a relative zero speed between the needles and bales.

4,187,585

CARDING MACHINE DRIVING APPARATUS

Jerry B. Lowe, Simpsonville, S.C., assignor to John D. Hollingsworth on Wheels, Inc., Greenville, S.C.

Filed Mar. 27, 1978, Ser. No. 890,253
Int. Cl.[2] D01G *15/36*
U.S. Cl. 19—98 **5 Claims**



1. A drive for a carding machine having a frame carrying a driven main cylinder and other carding components including a doffer comprising:

opposed braking surfaces carried by disk means;

mounting means fixing said disk means to said main cylinder in transverse aligment therewith;

said opposed braking surfaces extending radially outwardly, concentrically of said main cylinder;

caliper means having spaced opposed brake pads clampingly engaging said opposed braking surfaces;

means fixing said caliper means in respect of said frame;

means driving said other carding components from said main cylinder; and

switch means on said carding machine actuating said caliper means for effecting clamping engagement between said pads and respective opposed braking surfaces instantaneously stopping said main cylinder and other carding components;

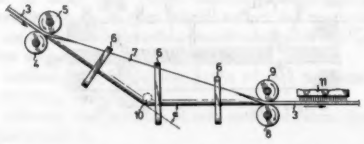
whereby the coming down of the web produced by the carding machine is avoided.

4,187,586

PROCESS FOR THE MANUFACTURE OF NON-WOVEN STRUCTURES

Valentin Semjonow, Hofheim am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Feb. 16, 1978, Ser. No. 878,436
Claims priority, application Germany, Feb. 18, 1977, 2706976
Int. Cl.[2] D04H *1/44, 1/46*
U.S. Cl. 19—161.1 **1 Claim**



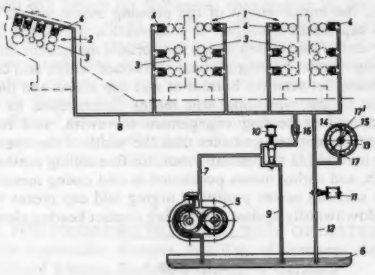
1. In a process for avoiding waste material in the manufacture of non-woven fabric, in which, prior to the main consolidation of a web, a part of each of the border zones for a web is folded towards the center, the improvement comprising directing the non-woven fabric in the folding zone about a bending zone, at an angle which is inclined towards that level towards which the border zone is folded, said angle being taken between an imaginary projection of an inclined plane of the web and the plane forward of the bending zone about which said web is guided, said angle being defined as $\alpha \cong 2\text{arc Sin } B_R/L$ wherein B_R is the width of individual border zones of said web, L is the length of the within said folding zone, said angle not to exceed about 90°, said width of both folded border zones being less than the ultimate entire width of said web, and said individual border zones being folded onto the same web surface.

4,187,587

TEXTILE MACHINE HAVING HYDRAULICALLY CONTROLLED DRAFTING ROLLERS

Louis Vignon, Geneva, Switzerland, assignor to Heberlein Hispano SA, Vernier-Geneve, Switzerland

Filed Mar. 16, 1978, Ser. No. 887,299
Claims priority, application Switzerland, Mar. 22, 1977, 3554/77
Int. Cl.[2] D01H *5/52*; B30B *15/16*
U.S. Cl. 19—272 **4 Claims**



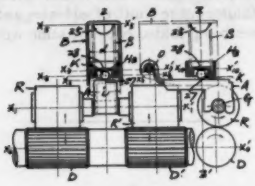
1. A textile machine comprising a plurality of sets of drafting rollers, hydraulic piston and cylinder assemblies respectively allocated to said sets of drafting rollers for maintaining pressure between the rollers in each set thereof by introduction of hydraulic pressure into the cylinders of said piston and cylinder assemblies, a main pipe circuit interconnecting all said cylinders, a tank for containing oil, a motor-operated pump connected to withdraw oil from said tank, a pipe system comprising both a feed pipe, interconnecting said pump and said main pipe circuit, and a first return-flow pipe branched from said feed pipe and leading to said tank for the return of oil thereinto, a first solenoid-controlled valve having alternative open and closed conditions and mounted in said pipe system for directing oil into said pipe circuit when in one of said open and closed conditions and through said first return-flow pipe when in the other of said open and closed conditions, a second return-flow pipe leading from said main pipe circuit to said tank, a second solenoid-controlled valve in said second return-flow pipe for controlling the flow of oil through said second return-flow pipe, and a pressure gauge connected to said main pipe circuit and operatively connected to control said first solenoid-controlled valve in response to hydraulic pressure in said main pipe circuit.

4,187,588

CONSTRUCTION OF PENDULUM ARM TYPE HIGH SENSITIVITY SELF-ALIGNING WEIGHTING ARM

Zenzaburo Tsukumo, 7of11, Masumi-cho, Ikeda, Japan, assignor to NTN Toyo Bearing Co. Ltd. and Zenzaburo Tsukumo, both of Osaka, Japan

Continuation of Ser. No. 754,890, Dec. 27, 1976, abandoned. This application Feb. 28, 1978, Ser. No. 882,221
Claims priority, application Japan, Dec. 26, 1975, 50-157034
Int. Cl.[2] D01H *5/50*
U.S. Cl. 19—281 **7 Claims**



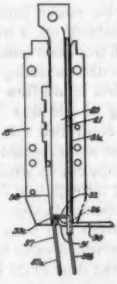
1. In a pendulum arm type, self-aligning weighting arm assembly for use with textile machinery and having casing means, said casing means including a pivot member, weighting arm means pivotally mounted at one end to the said pivot means of said casing means for movement in a plurality of directions, rotatably driven roller means rotatably mounted on the opposite end of said weighting arm means, driving body means operatively positioned with said driven roller means for rotating same and pressing means operatively engaged with said weighting arm means intermediate the ends thereof urging said driven roller means into engagement with said driving means, the improvement of the pressing means which comprises cap means U-shaped in cross-section positioned in the lower end of said casing means for vertical movement therein, a rolling contact bearing element positioned within said casing means and between the bottom of said cap means and the top surface of the weighting arm means intermediate its ends thereof and in bearing engagement therewith, said rolling contact element being smaller than the width of the open end of the inverted U-shaped cap means for free rolling movement therein, and spring means positioned in said casing means and above said cap means positively urging said cap means vertically downwardly against said rolling contact bearing element.

4,187,589

SLOTTING FASTENER DRIVING DEVICE

William T. Jobe, II, 2263 Swings Corner Rd., Bethel, Ohio 45106

Filed Feb. 27, 1978, Ser. No. 881,413
Int. Cl.[2] B25C *1/04*
U.S. Cl. 227—66 **12 Claims**



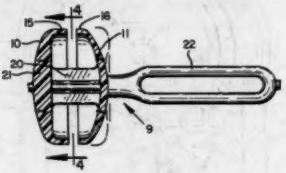
1. In a tool for securing a rigid sheet of material to a base so as to be slidable thereon, by means of fasteners, said tool having a guide body, a fastener driver reciprocal in said guide body, a fastener magazine, and means for feeding fasteners from said magazine to said guide body in a position to be driven by said driver, means for forming a slot in the sheet of material around the fastener shank contemporaneous with driving of the fastener.

4,187,590

ELASTIC FASTENER

Richard D. Harris, Albany; Franklin G. Smith, and Jerome F. Moshofsky, both of Portland, all of Oreg., assignors to R. D. Bussard & Son, Inc., Albany, Oreg.

Continuation-in-part of Ser. No. 789,024, Apr. 20, 1977, Pat. No. 4,118,835. This application Aug. 24, 1978, Ser. No. 936,322
Int. Cl.[2] A44B *21/00, 1/26*
U.S. Cl. 24—73 P **4 Claims**



1. An elastic fastener for fastening together layers of material, comprising:

a pair of spaced elastic, generally dish-shaped head members adapted to fit on opposite sides of layers of material to be joined, said head members each each having a rim, said head members being disposed concavely inwardly with their rims facing each other;

an elastic shank member joining said head members and adapted to pass through an opening in said layers or material,

one of said dish-shaped head members having a thicker bottom and thus less flexibility than the other of said dish-shaped head members so as to resist passage through said opening;

a boss positioned on the exterior of said other of said dish-shaped head members; and

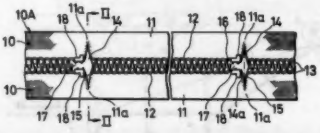
means disposed in said boss for releasably attaching a pulling means to said other of said dish-shaped head members for deformably pulling the same through said opening in said layers of material, thereby to position said head members on opposite sides of said layers of material and establish said fastener in place.

4,187,591

CONTINUOUS SLIDE FASTENER STRINGERS

Shunji Akashi, Kurobe, Japan, assignor to Yoshida Kogyo K K, Tokyo, Japan

Continuation of Ser. No. 814,218, Jul. 11, 1977, abandoned. This application Sep. 21, 1978, Ser. No. 944,290
Claims priority, application Japan, Jul. 12, 1976, 51-92624[U]
Int. Cl.[2] A44B *19/00*
U.S. Cl. 24—205 R **2 Claims**



1. A pair of slide fastener stringers of continuous length comprising: a pair of opposed stringer tapes of continuous

length and containing thermoplastic fibers; a pair of rows of fastener elements having interengageable coupling heads and carried on and along the respective confronting inner longitudinal edges of said stringer tapes, thread means securing said rows of fastener elements to the respective stringer tapes; and a plurality of top end stops attached to said rows of fastener elements, said stringer tapes having a plurality of openings each disposed at substantially equal intervals and extending transversely across the rows of fastener elements when coupled and beyond the width of a slider and defining a substantially diamond-like configuration with the longer diagonal of the diamond oriented generally normal to said rows of fastener elements and being of a length such that the opening terminates short of the outer longitudinal edges of the respective stringer tapes and forms a substantially V-shaped cut portion at one direction of the rows of fastener elements when coupled said rows of fastener elements including a plurality of coupling head-free sections each arranged immediately adjacent to said opening and opposite to said V-shaped cut portion, said top end stop being disposed at their portions where said coupling head-free sections are located, and the fibers of said stringer tapes being fused together at and along marginal edges defining said openings by thermoplastic material derived solely from the thermoplastic fibers of said stringer tapes.

4,187,592

METHOD FOR PRODUCING DECORATIVE FABRIC

Rebecca A. Bissi, 820 Forest Ave., Apt. E-2, Evanston, Ill. 60202

Filed Aug. 25, 1978, Ser. No. 936,733

Int. Cl.[2] D06C *23/00*

U.S. Cl. 28—163 **21 Claims**

1. An improved method for producing decorative fabric of the type wherein a desired geometrical design is imparted onto a fabric through dyeing, wherein said method comprises:

A. smocking said fabric by gathering portions of said fabric into juxtaposition so as to form a plurality of ridges on a top side of said fabric;

B. generally applying a plurality of color dye means to the exposed portions of said smocked fabric;

C. hardening said smocked fabric through stiffening means so as to stiffen said ridges on said top side of said fabric so as to make said ridges capable of maintaining said smocked position even when touched and manipulated;

D. applying a substantially concentrated color dye agent to the upper portions of said ridges;

E. outlining the uppermost peaks of said ridges with an outlining medium;

F. releasing said portions of said gathered fabric from said justaposition;

G. finishing said colored fabric having said desired design into decorative fabric material for use in such articles of apparel, wall decorations and upholstery material.

4,187,593

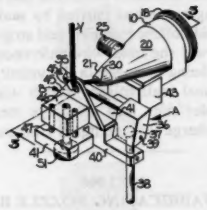
YARN TEXTURING AIR JET WITH CYLINDRICAL AND PLANAR BAFFLES

Samuel T. Price, Kennett Square, Pa., assignor to Enterprise Machine and Development Corporation, New Castle, Del.

Filed Apr. 9, 1979, Ser. No. 28,340

Int. Cl.[2] D02G *1/16*

U.S. Cl. 28—254 **7 Claims**



1. In a yarn texturing air jet of the type including an elongate housing having a central bore therethrough, an entrance end for passage of multifilament yarn into said air jet, an exit orifice for passage of yarn from said air jet, and means for directing pressurized air into the central bore of said housing to contact the yarn and pass outwardly through the exit end of said air jet to impart crimps, curls and loops to the filaments as the yarn passes through said air jet; the combination therewith of first and second baffles for enhancing the texturing of the yarn by said air jet, said first and second baffles being supported adjacent said exit orifice for successive engagement by the yarn and air leaving said air jet, said first baffle comprising an elongate element with a longitudinal axis extending across the path of travel of and being engaged by the yarn downstream of said exit orifice of said air jet, said second baffle comprising a relatively thin flat baffle plate positioned downstream of said first baffle and substantially perpendicular to the path of travel of the yarn, and said baffle plate including an opening through which the yarn passes after leaving said first baffle.

4,187,594

ROLL FOR PRESSURE TREATING WEBS OF MATERIAL

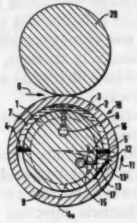
Valentin Appenzeller, Kempen, Fed. Rep. of Germany, assignor to Eduard Küsters, Krefeld, Fed. Rep. of Germany

Filed Mar. 14, 1978, Ser. No. 886,431

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1977, 2744524; Dec. 7, 1977, 2754380

Int. Cl.[2] B21B *13/02*

U.S. Cl. 29—116 AD **12 Claims**



1. In a roll for pressure treating webs of material comprising a stationary core which is surrounded by a rotatable hollow cylinder radially spaced from the core, said roll having between the core and the hollow cylinder, longitudinal seals and end seals which seal off a longitudinal chamber which extends between the core and the hollow cylinder on one side of the roll and is adapted to be filled with a pressure liquid, and

discharge means provided in the core for discharging leakage liquid from the remaining space between the core and the hollow cylinder, which space remains between the core and the hollow cylinder on the other side of the roll, the improvement comprising:

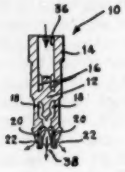
a strip, which extends longitudinally along the hollow cylinder for the length of said longitudinal chamber and is secured to the core, said strip having a free long edge cooperating with the inner circumferential surface of the hollow cylinder to collect therefrom said leakage liquid in said remaining space and carried by said surface during rotation of said hollow cylinder, said strip extending from the core toward the inner circumference of the hollow cylinder and being arranged in the vicinity of that one of said longitudinal seals toward which when rotating the hollow cylinder runs, said discharge means being positioned to discharge leakage liquid collected by said strip.

4,187,595

METHOD OF FABRICATING NOZZLE BLADES FOR LASERS

Ralph F. Kuhn, Jr., Calabasas, Calif., assignor to The United States of Amrica as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 12, 1978, Ser. No. 941,718
Int. Cl.² B23P *15/00*
U.S. Cl. 29—157 C **1 Claim**



1. A method of fabricating nozzle blades for lasers comprising the following steps:

(a) forming an annular-shaped blade core of a rigid, chemically resistant material,

(b) forming a pair of opposed circumferentially located grooves in said annular-shaped core,

(c) machining an open-ended exit nozzle on the outside diameter of said core intermediate said grooves,

(d) pressing said exit nozzle into its final configuration;

(e) placing a chemically resistant, nonconductive, low melting point material within said exit nozzle,

(f) machining a plurality of pairs of cutout portions within said core,

(g) electric discharge machining a first set of passageways within said core adjacent said cutout portions in order to interconnect said cutout portions,

(h) placing a chemically resistant, nonconductive, low melting point material within said cutout portions and said first set of passageways,

(i) electrodepositing said core with a closure of chemically resistant material,

(j) removing said chemically resistant, nonconductive, low melting point material from said cutout portions, said first set of passageways and said exit nozzle, thereby forming the coolant channels, injection manifolds and trip manifolds of said nozzle,

(k) electric discharge machining a centrally located feed hole within said core opposite said exit nozzle, said feed hole being operably connected to said coolant channels, injection manifolds and trip manifolds, and

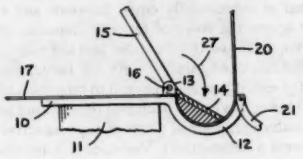
(l) electric discharge machining a second set of passageways in said closure adjacent said exit nozzle, thereby forming additional trip manifolds.

4,187,596

METHOD AND APPARATUS FOR MANUFACTURING A SOLAR ENERGY COLLECTOR

Robert L. Nevins, 12 Franklin Rd., Great Neck, N.Y. 11024

Filed Oct. 20, 1978, Ser. No. 953,197
Int. Cl.² B23P *15/26;* B21D *53/02*
U.S. Cl. 29—157.3 C **1 Claim**



1. A method for producing thermally efficient tubing with an attached solar heat collecting sheet; the method comprising steps of:

clamping a portion of the sheet above a half-cylindrical female mold,

pivoting a male die against the sheet to force the sheet to conform to the half-cylindrical shape of the female mold and to enable the bitter end of said sheet to stand generally perpendicular to the clamped portion of the sheet,

removing the male die from the female mold and sheet combination,

placing a tube in the female mold on top of the conforming shape of the sheet portion,

drawing another female mold over the exposed surface of the tube to press the balance of the sheet portion against the tube and to cause this sheet portion to conform to the shape of the tube,

drawing the female molds together to stretch and to press the sheet portion into close contact with the tube,

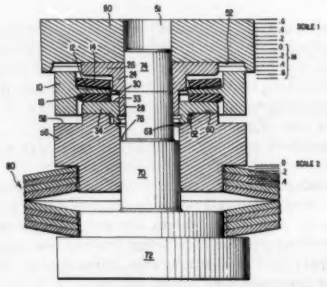
and joining the bitter end of the sheet portion to the body of the sheet.

4,187,597

TORSIONAL VIBRATION DAMPER HAVING TWO PART HUB

Robert C. Bremer, Jr., Brownsburg, Ind., assignor to Wallace Murray Corporation, New York, N.Y.

Division of Ser. No. 724,058, Sep. 16, 1976, Pat. No. 4,150,587.
This application Aug. 18, 1978, Ser. No. 935,012
Int. Cl.² B25B *27/14*
U.S. Cl. 29—281.3 **1 Claim**



1. An apparatus for assembling a torsional vibration damper, the damper being of the type having an outer inertia member carrying a radially extending web, the web sandwiched by a pair of elastomer elements, the elastomer elements being sandwiched by two pieces of a two-piece hub which are held together by deformation, the assembly apparatus including,

(a) a base from which an integral stud projects, the stud having at least two portions of different diameters, the said two stud portions joined by an annular shoulder, the shoulder forming a swaging deformation zone,
(b) an annular ram having a through aperture, the aperture receiving at least a portion of the stud,
(c) an annular anvil having a through aperture, the aperture receiving at least a portion of the stud, the anvil positioned between the ram and the base,
(d) Belleville springs abutting said base and said anvil and urging the anvil away from the base,
(e) whereby, with an unassembled damper of the type recited placed between the ram and the anvil, movement of the ram towards the anvil will be resisted by the Belleville springs, thereby compressing and distorting the elastomer members until a flat part of the Belleville spring load-deflection characteristic is reached, at which time the desired maximum compression and distortion of the elastomer elements is reached and further ram movement, to effect deformation of at least one of the hub members, does not result in further distortion of the elastomer members.

4,187,598

FILAMENT WOUND PERFORATE PLATE SYSTEM

Charles B. Pittinger, Jr., 320 Cockeys Mill Rd., Reisterstown, Md. 21136

Division of Ser. No. 587,648, Jun. 17, 1975, Pat. No. 4,035,915. This application Jul. 6, 1977, Ser. No. 813,351
Int. Cl.[2] B23P *11/00*; B26B *27/00*; A01D *55/18*
U.S. Cl. 29—513 **13 Claims**

3. The method of manufacturing a vegetation filament-trimmer plate, comprising the steps:
(i) winding successive intermediate portions of a filament over and around the periphery of a plate through a plurality of temporary openings in the periphery of the plate;
(ii) closing the plurality of temporary openings to outward passage of the windings therefrom by surrounding the plurality of temporary openings with a member; while
(iii) leaving a free end of the filament extending from the plate; thereby manufacturing a vegetation filament-trimmer plate.

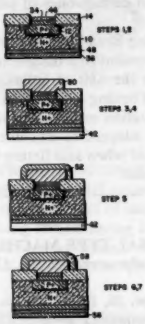
4,187,599

SEMICONDUCTOR DEVICE HAVING A TIN METALLIZATION SYSTEM AND PACKAGE CONTAINING SAME

Dervin L. Flowers; Richard L. Greeson, both of Scottsdale, and V. Louise Rice, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 734,794, Oct. 22, 1976, abandoned, which is a continuation of Ser. No. 567,960, Apr. 14, 1975, abandoned. This application May 22, 1978, Ser. No. 908,037
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—588 **3 Claims**

1. A method of encapsulating a semiconductor device comprising:
providing a semiconductor device comprising a body of a first conductivity type, having first and second major surfaces, a region of second conductivity type in said body at a first major surface and forming a PN junction at said first surface, and an insulating layer covering said body and said PN junction at said first surface, a barrier metal on said second region at said first surface, and a barrier metal on said second major surface;
selectively electroplating a layer of silver on said barrier metal using said insulator as a mask, said silver forming a bump extending above said insulator;



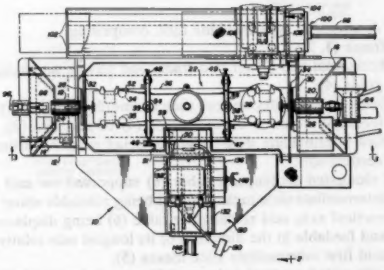
selectively electroplating a layer of tin on said silver bump using said insulating layer as a mask;
providing a glass housing and conductor means for making electrical contacts external to said housing; and
heating said assembly to metallurgically bond said conductor means to said tin layer and simultaneously said semiconductor device in said glass housing.

4,187,600

APPARATUS FOR MACHINING RAILROAD TRUCK BOLSTERS

Richard P. Yeates, Downers Grove; Boris S. Terlecky, Fox Lake, and Jagdish K. Shah, Chicago, all of Ill., assignors to Trailer Train Company, Chicago, Ill.

Filed Sep. 26, 1978, Ser. No. 945,837
Int. Cl.[2] B23P *23/00*
U.S. Cl. 29—564 **11 Claims**



1. An apparatus for machining railroad wheel truck bolsters comprising:
a base;
a fixture mounted for rotation about an axis on said base, said fixture including clamp means to clamp the truck bolster on said fixture in a predetermined position;
rotating means for rotating said fixture about said axis to different predetermined positions so that the truck bolster may be oriented in proper position for machining various critical surfaces of the bolster;

lock means for locking said fixture in a selected one of said predetermined positions;

a first machining head mounted on one side of said fixture for sliding movement in a first direction horizontally and parallel to the axis of rotation of said fixture, in a second direction horizontally and perpendicularly to the axis of rotation of said fixture, and in a third direction vertically and perpendicularly to the axis of rotation of said fixture so that certain of said various critical surfaces of the bolster can be machined by said first machining head when said fixture is in certain ones of said predetermined position;

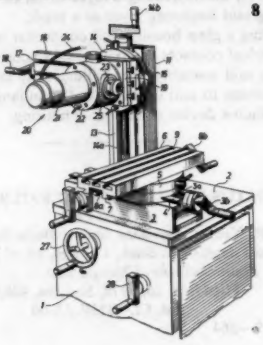
a second machining head mounted on the other side of said fixture for movement in a direction horizontally and perpendicularly to the axis of rotation of said fixture, said machining head having a combined boring and facing tool mounted for rotation on said machining head said boring and facing tool adapted to machine the bolster bowl surface of the bolster when said fixture is in one of said predetermined positions.

4,187,601

UNIVERSAL TYPE MACHINE TOOL

Per O. Aldrin, Strandpromenaden 25, 130 11 Saltsjö-Duvnäs, Sweden

Filed Apr. 26, 1978, Ser. No. 900,326
Claims priority, application Sweden, May 4, 1977, 7705179
Int. Cl.[2] B23C *1/12, 1/14*
U.S. Cl. 29—560 **8 Claims**



1. A universal type machine tool, comprising:

a frame (1, 2);

a horizontal bed (3) on said frame and having an elongated guide (4);

a first rotatable intermediate slide means (5) displaceably and feedably mounted on said guide (4) of said bed (3), said first intermediate slide means (5) being rotatable around a vertical axis;

an elongated rectangular table (6) supported on said first intermediate slide means (5) and being rotatable about said vertical axis, said rectangular table (6) being displaceable and feedable in the direction of its longest side relative to said first intermediate slide means (5);

an elongated vertical column (11) mounted to said frame, said column (11) having a vertically directed longitudinal axis;

a second rotatable intermediate slide means (14) mounted to said vertical column (11) and being displaceable and feedable along said longitudinal axis of said vertical column (11), said second intermediate slide means (14) being rotatable around a horizontal axis;

an elongated rectangular plate (16) mounted to said second intermediate slide means (14) and being displaceable and feedable in the direction of its longest side relative to said second intermediate slide means (14), said rectangular plate (16) also being rotatable about said horizontal axis;

feed means (18) coupled to said rectangular plate (16) for feeding said rectangular plate (16) relative to said second intermediate slide means (14) in the direction of the longest side of said rectangular plate (16); and

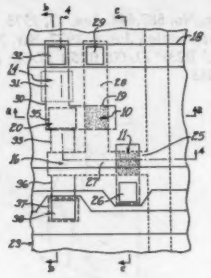
a drive unit (20) selectably mountable to said displaceably feedable rectangular plate (16) and, when mounted to said rectangular plate (16), being displaceable relative to said rectangular plate in the direction of the longest side of said rectangular plate (16) for fixation of said drive unit (20) in different positions, said drive unit (20) being turnable relative to said rectangular plate (16) around a horizontal axis.

4,187,602

STATIC MEMORY CELL USING FIELD IMPLANTED RESISTANCE

David J. McElroy, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 754,208, Dec. 27, 1976, Pat. No. 4,092,735.
This application May 30, 1978, Ser. No. 910,246
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—571 **8 Claims**



1. A method of making an integrated circuit having first and second resistors and an active circuit element comprising the steps of: forming a first resistor in the face of a silicon body by ion implanting; growing thermal oxide over said first resistor; applying a layer of polysilicon on said face at least partially overlying the thermal oxide to define a second resistor and to define an electrode of said active circuit element; implanting the polysilicon with impurity to a low level of concentration to define the resistivity of the second resistor; and introducing impurity into the polysilicon layer in all areas except that of the second resistor to form low resistance connections and said electrode; the first and second resistors and the active circuit element being interconnected in a circuit.

5. A method of making electrical connection simultaneously to a region of a face of a semiconductor body and to a strip of polycrystalline silicon on said face, comprising the steps of: exposing a contact area on said face of the body over said region, with the surrounding area on said face being covered with an insulating coating; depositing a strip of polycrystalline silicon over the insulating coating and extending into the contact area but not covering said contact area; applying another insulating coating on said face over the polycrystalline silicon and opening an aperture over the contact area to expose a portion of the region and to expose a portion of the polycrystalline silicon over the region; and applying a strip of metal to said face extending along the insulating coating and into the aperature at the contact area to engage said portion of the region and said portion of the polycrystalline silicon to provide said electrical connection.

4,187,603

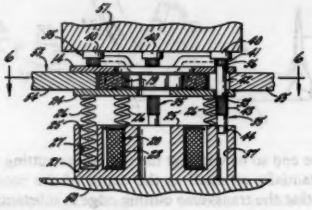
METHOD OF MAKING AN ELECTRICALLY RELEASED ELECTROMAGNETIC FRICTION BRAKE

Edward R. Kroeger, Beloit, Wis., assignor to Warner Electric Brake & Clutch Company, South Beloit, Wis.

Division of Ser. No. 828,525, Aug. 29, 1977, Pat. No. 4,156,478. This application Oct. 16, 1978, Ser. No. 951,770

Int. Cl.² H01F *41/00*

U.S. Cl. 29—602 R **2 Claims**



1. A method of assembling a brake having a subassembly comprising (a) a shell, (b) an annular electromagnetic coil disposed within said shell and (c) spring means disposed within said shell, said brake further having an armature, having friction material adapted to rotate relative to said subassembly and said armature, and having a plate adapted to be fixed against rotation relative to said subassembly and said armature, said armature being drawn away from said friction material and toward one face of said shell when said coil is energized and being resiliently biased into engagement with said friction material and pressing the latter against said plate when said coil is de-energized, said shell, said armature and said plate all being formed with angularly spaced holes adapted to be alined with one another, said method comprising the steps of, placing one face of said armature next to said one face of said shell with the holes in said armature alined with the holes in said shell, placing said friction material next to the other face of said armature with the friction material located radially inwardly of said holes, placing one face of a gage of predetermined axial thickness next to said other face of said armature, the axial thickness of said gage being greater than the axial thickness of said friction material, placing said plate next to the other face of said gage with the holes in said plate alined with the holes in said armature and said shell, inserting pins into the holes in said plate, said armature and said shell, said pins being sized to be received with a press fit in the holes in said plate and said shell and with a loose fit in the holes in said armature, pressing said pins into said plate and said shell until said armature abuts said shell, said gage abuts said armature and said plate abuts said gage, and removing said gage from between said armature and said plate to enable said spring means to press said armature into engagement with said friction material and to shift said armature away from said one face of said shell by a distance equal to the difference between the axial thickness of said gage and the axial thickness of said friction material.

4,187,604

TOOL AND METHOD FOR INSTALLING FLEXIBLE TUBING IN A MULTI-CAPSULE REED RELAY SWITCHING ASSEMBLY

James V. Koppensteiner, Chicago; Khaja M. Jameel, Glen Ellyn; Charles K. Kubik, Brookfield, and George Len, Arlington Heights, all of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Oct. 2, 1978, Ser. No. 947,977

Int. Cl.² H01H *11/00*

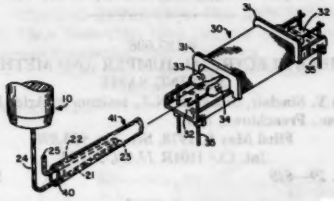
U.S. Cl. 29—622 **7 Claims**

1. A tool for inserting a flexible tube between two or more parallel and spaced apart glass encapsulated reed switches of a reed relay switching assembly, said tool comprising;

a rigid horizontal bottom leg including first and second ends;

a deflectable and angularly positioned top leg including first and second ends; and,

a rounded insertion knee joining said top leg first end and said bottom leg first end;



said tool slidably inserted into said tubing, deflecting said top leg toward said bottom leg and causing said top leg to apply pressure to an inside wall of said tubing, vertically elongating said tubing and allowing for insertion of said tubing between said reed switches.

4,187,605

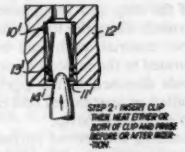
METHOD OF MAKING ELECTRICAL CONNECTOR ASSEMBLY

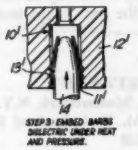
Gerald J. Selvin, Birmingham, Mich.; Leland W. Oliver, Santa Ana, Calif.; Stephen K. Yamamoto, Los Angeles, Calif., and Clarence V. Hogan, Sun Valley, Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 788,315, Apr. 18, 1977, Pat. No. 4,114,976, which is a continuation-in-part of Ser. No. 679,342, Apr. 22, 1976, abandoned. This application Mar. 6, 1978, Ser. No. 883,913

Int. Cl.² H02G *15/00*

U.S. Cl. 29—629 **13 Claims**





1. The method of making an electrical connector assembly, said method comprising the steps of:

providing a thermally deformable insulator body having a bore therein;

providing a contact retention clip comprising a longitudinally slit, hollow resilient body, said clip body embodying a forwardly and inwardly extending spring tine struck from the wall thereof providing an aperture in said wall and said clip body having a plurality of discontinuities therearound spaced from said aperture;

inserting said clip into said bore;

heating the portion of said insulator body surrounding said clip body in the vicinity of said discontinuities to cause said insulator body portion to soften; and

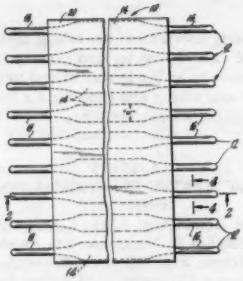
while said insulator body portion is softened, causing said clip body to expand in said bore to cause said insulator body portion to seize upon said discontinuities and to prevent axial movement of said clip in said bore.

4,187,606

FLEXIBLE ELECTRICAL JUMPER AND METHOD OF MAKING SAME

William Y. Sinclair, Stockton, N.J., assignor to Aries Electronics, Inc., Frenchtown, N.J.

Filed May 8, 1978, Ser. No. 903,898
Int. Cl.[2] H01R *13/04, 31/08*
U.S. Cl. 29—629 **5 Claims**



1. A method of making a flexible electrical jumper comprising the steps of:

providing an elongated flat strip of electrically conductive material;

milling out of the central portion of the strip along the longitudinal axis thereof;

forming said strip into a plurality of elongated, generally parallel leads extending transverse to the longitudinal axis of the strip and being interconnected by a carrier which extends along the longitudinal axis of the strip of conductive material, each lead including a central flat portion formed in the milled out portion of the strip, and opposed ends disposed in the portion of the strip which is not milled, at least one of said ends being releasably connected to said carrier strip;

embedding the central portions of the array of leads within a strip of flat flexible electrically insulating material; and

removing said carrier strip from the ends of the leads.

4,187,607

HORSEMAN'S POCKET KNIFE

Ernest G. Simuro, 624 Fenimore Rd., Mamaroneck, N.Y. 10543; Abraham A. Turk, and Nathan M. Turk, both of Rocking Horse Ranch, Highland, N.Y. 12528

Filed Apr. 24, 1978, Ser. No. 899,336
Int. Cl.[2] F41B *63/06;* B26B *3/04*
U.S. Cl. 30—152 **6 Claims**

1. A horseman's pocket knife of a size that will conveniently fit in a pants pocket, said knife having a handle with a recess of a predetermined depth and a plurality of blades pivoted about pivot pins located toward each end of the handle between closed positions in which the blades are positioned in the recess in the handle for storage and operative positions in which they are pivoted out from the handle recess for use, wherein the improvement comprises: one of said blades being a hoof-cutting blade for planing the bottom of a horse's hoof and shaping the hoof, said hoof-cutting blade having a lateral cutting edge along one lateral edge of the blade, said hoof-cutting blade being pivotally connected to the handle at one of said pivot pins so that it can be folded into the handle in such a way that the lateral cutting edge is concealed in the handle, said hoof-cutting blade additionally having its free end being of a hook shape in a plane perpendicular to the plane of the lateral width of the blade, said hook-shaped end having a transverse cutting edge transverse to the longitudinal dimension of the blade, the lateral width of the cutting blade decreasing toward said hook-

shaped free end so its width at the transverse cutting edge is at least substantially as small as the depth of the recess in the handle so that the transverse cutting edge is substantially concealed in the recess when in the closed position and the hook shape having an arc such that the hoof-cutting blade fits within the handle without interfering with any other blade by extending about such a blade.

4,187,608

IMPLANTABLE TEETH AND METHOD OF MAKING

Andrew C. Nyce, 1157 Shore Rd., Cape Elizabeth, Me. 04107

Continuation-in-part of Ser. No. 407,085, Oct. 17, 1973, abandoned. This application Jan. 12, 1976, Ser. No. 648,307
Int. Cl.[2] A61C *13/00*
U.S. Cl. 433—201 **12 Claims**

1. A method of producing an artificial tooth for implantation in a natural tooth socket in the human body comprising the steps of mixing substantially spherical power metallurgical particles compatible with human body tissue of different size diameters such that the smaller particles fill the interstices of the next larger particles, molding an exact replica of an extracted tooth from said particles thereby creating a molded replica of the natural tooth having a porosity which allows the periodontal membrane to enter and grow into the pores of the implant and coating exterior portions of said molded replica with a finish having approximately the coloring of a natural tooth.

4,187,609

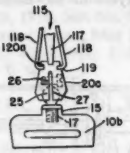
SUBMERGED FUNCTIONAL IMPLANT AND METHOD

Alfred E. Edelman, 2723 Federal St., Camden, N.J. 08105

Continuation of Ser. No. 819,119, Jul. 26, 1977, abandoned, which is a continuation of Ser. No. 559,226, Mar. 17, 1975, abandoned. This application Jul. 18, 1978, Ser. No. 925,764
Int. Cl.[2] A61C *13/00*
U.S. Cl. 433—176 **1 Claim**

1. A submerged dental implant comprising a non-rotatable insert portion including an enlarged permanent body portion and a short hollow internally threaded neck portion of relatively small cross-section adapted to receive the threaded stem

of a thin removable temporary cap member or a similarly threaded stem of an artificial tooth receiving head, said insert portion including an applied cap being adapted to be wholly submerged in a recess of the patient's jaw and thereafter covered by surface skin of the jaw and after a considerable period of time the surface skin of the gum and the temporary cap of the said submerged implant may be removed, said submerged implant neck portion being then adapted to receive an artificial



tooth receiving head member which projects above the surface of the gum to receive an artificial tooth, said tooth receiving head member having a stem fitting the neck of the insert and a universal joint including a ball member, and a socket portion fitting over the ball member, said socket portion being externally shaped to receive an artificial tooth, said socket portion comprising a pair of flexible side portions, partially separated by a split and adjustable means for holding said flexible portions in engagement with the ball member of the joint.

4,187,610

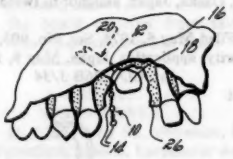
IMPACTED TOOTH LIGATION CHAIN

Thomas F. Ziegler, 6924 Old Chapel Dr., Cincinnati, Ohio 45244

Continuation-in-part of Ser. No. 675,547, Apr. 9, 1976, abandoned. This application Feb. 13, 1978, Ser. No. 877,305

Int. Cl.[2] A61C *7/00*

U.S. Cl. 433—24 **3 Claims**



1. A method of applying an eruptive force to a patient's impacted tooth comprising:

surgically exposing the anatomic crown of the impacted tooth,

encircling the anatomic crown with a tooth encircling loop of a ligation chain, said ligation chain comprising a wire having two ends, said wire twisted so as to provide at a position intermediate the ends thereof a tooth encircling loop, the other end of said tooth ligation chain comprising the ends of said wire, said tooth encircling loop being generally circular in shape and having a diameter greater than the anatomic crown of the impacted tooth to be erupted so that after the anatomic crown of the impacted tooth has been surgically exposed said tooth encircling loop can be placed over said crown and said chain can be secured to said tooth by twisting said wire, a plurality of eyelets formed by twisting said wire, said eyelets lying between the ends of said wire and said tooth encircling loop, said eyelets being separated from each other by twists in the wire, said eyelets providing a position for attaching a ligature thread to the ligation chain,

twisting the chain adjacent to the anatomic crown so that the tooth encircling loop cannot slip over the tooth,

surgically closing the wound,

attaching a ligature thread to an eyelet of the ligation chain, and

tensioning the ligature thread so as to apply an eruptive force on the impacted tooth.

4,187,611

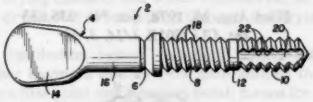
DENTAL RETENTION PIN AND METHOD

Kai C. Chan, Iowa City, Iowa, assignor to University of Iowa Research Foundation, Iowa City, Iowa

Filed Oct. 7, 1977, Ser. No. 840,280

Int. Cl.[2] A61C *5/00*

U.S. Cl. 433—225 **5 Claims**



1. A dental retention pin threadedly engageable in a pinhole drilled in the dentin at the base of a restoration cavity of a tooth for projecting into said cavity to assist in retaining in said cavity a subsequently inserted body of restorative material such as a dental amalgam, said pin comprising,

a lower shaft portion having external threads of a given root diameter for engaging the dentin and a vent passage means for releasing fluid from the pinhole as the lower shaft portion is inserted therein,

a pinhole-sealing portion at the upper end of the lower shaft portion, said pinhole-sealing portion being insertable into the pinhole and having a peripheral sealing surface for engaging the pinhole surface to prevent fluid from entering the pinhole when the lower shaft portion is fully inserted in said pinhole, and

an upper shaft portion extending upwardly from the pinhole-sealing portion for embedment in restorative material in a restoration cavity;

wherein the crest diameter of said threads is greater than the diameter of said pinhole sealing portion;

wherein the diameter of the pinhole sealing portion is greater than the root diameter of said threads.

4,187,612

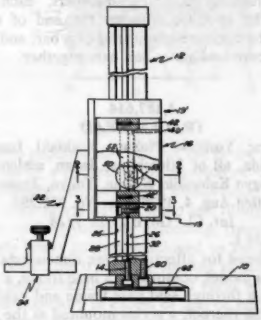
HEIGHT GAGE

Ian M. Scott, East Greenwich, R.I., assignor to Brown & Sharpe Manufacturing Company, North Kingstown, R.I.

Filed Sep. 12, 1978, Ser. No. 941,568

Int. Cl.[2] G01B *7/02*

U.S. Cl. 33—172 E **7 Claims**



1. A height gage comprising a base, a vertical circular column mounted on said base, a carriage movable on said column, said column having a longitudinal groove therein with at least

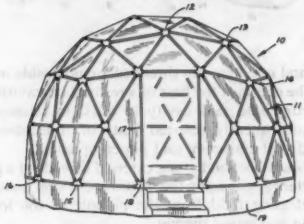
one surface extending on a chord of said column, a second surface on a radius of said column in said groove, shoe means on said carriage engaging the second surface, resilient means on said shoe engaging said one surface of said groove, means coupled between said column and said carriage for generating an electrical signal as a function of distance and displaying the information.

4,187,613

JIG FOR PRECISE MEASUREMENT OF PANELS FOR GEODESIC

Robert P. Ivers, and Mark J. Thimsen, both of Minnetonka, Minn., assignors to Geodesic Shelters, Inc., Minnetonka, Minn.

Filed Aug. 24, 1978, Ser. No. 936,633
Int. Cl.[2] G01B 3/14, 3/38
U.S. Cl. 33—174 G **8 Claims**



1. A jig of accurately measuring triangular panels for a geodesic dome of the type having a plurality of generally flat polygonal hub plates and interconnecting struts, each hub having a recessed panel-receiving rabbet in at least some of its edges and each strut having a recessed panel-receiving rabbet in its outer edges, said jig comprising:

(A) three shoes adapted to engage the recessed rabbets of adjacent hubs of an assembled dome, each shoe having:

(1) a straight edge engageable with the longitudinal side wall of one of said hub rabbets, the length of said straight edge being the same as the length of said rabbet side wall,

(2) a flat surface engageable with the face of said rabbet,

(3) a thickness at least equal to the depth of said rabbet, and

(4) a fastener-receiving aperture adjacent each end,

(B) three elongated bars each extending between two of said shoes, each bar having:

(1) a length at least equal to the distance between adjacent dome hubs, and

(2) a fastener-receiving aperture adjacent each end, and

(C) six adjustable fastening members, each extending through the aperture adjacent the end of a shoe and through the aperture at one end of a bar, and adapted to rigidly secure said shoes and bars together.

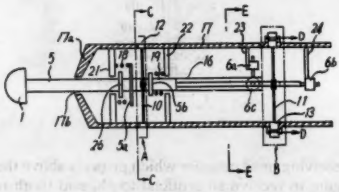
4,187,614

TRACER HEAD

Hisanori Abiru; Yoshiaki Nakao; Yoshiaki Imamura, and Hidetaka Sada, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 4, 1978, Ser. No. 931,280
Int. Cl.[2] G01B 7/02, 7/28
U.S. Cl. 33—174 L **7 Claims**

1. A tracer head for effecting three dimensional tracing of the surface of a model, comprising a base frame, a tracer shaft means extending through said base frame and having a tracer shaft on one end thereof, a stylus mounted at the free end of said tracer shaft for tracing the surface of the model, a plurality of at least two supports for said tracer shaft means in said base frame spaced along the length of said tracer shaft means, the support closer to the end of said tracer shaft means supporting said tracer shaft adjacent the other end of said tracer shaft, said tracer shaft means further having a rod spring extending from the other end of said tracer shaft and being supported by the second support and having a moderate resiliency in the radial direction of said tracer shaft means, each support including a member which has a moderate resiliency in the thrust direction and at the least substantially no resiliency and at the most rigidity in the radial direction of the tracer shaft means, a thrust displacement detector adjacent said rod spring for having movement of the stylus in the thrust direction transmitted



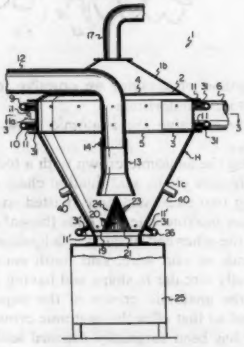
thereto by the rod spring, a pair of lateral movement detectors positioned adjacent said tracer shaft means between said supports for detecting components of lateral movement of said tracer shaft means imparted thereto by lateral movement of said stylus, and a cylindrical transmission member around said rod spring and mounted on said tracer shaft means between said supports and movable upon lateral movement of said tracer shaft and bending of said rod spring as a result of such movement and contacting said lateral movement detectors for transmitting the lateral movement thereto.

4,187,615

PROCESS FOR TREATING FEATHERS AND CYCLONE USED FOR CARRYING OUT THE PROCESS

Takuzo Iwata, Osaka, Japan, assignor to Iwata Co., Ltd., Kyoto, Japan

Filed May 5, 1978, Ser. No. 903,780
Claims priority, application Japan, May 9, 1977, 52-53521
Int. Cl.[2] F26B 3/34
U.S. Cl. 34—1 **15 Claims**



1. A process for treating feathers, adapted for separating impurities attached thereto, comprising the steps of;

(a) introducing feathers into a treatment zone;

(b) generating, in the treatment zone, by horizontal swirl motion of introduced feathers together with downward movement of said feathers toward the bottom of said zone;

(c) ejecting a flow of ionized air transversely and inwardly directed to said swirl motion of said feathers from substantially the entire outer periphery of the swirl motions in

order to cause said impurities to be separated from said feathers while said separated impurities are exhausted to the outside of said cyclone at the center of the swirl motion; and

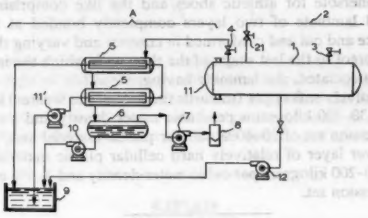
(d) removing purified feathers from said treating zone.

4,187,616

METHOD FOR COOLING AGED BOARD MATERIAL

Hirofumi Yamada; Noboru Takaki, and Michio Masuda, all of Amagasaki, Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed May 10, 1978, Ser. No. 904,519
Claims priority, application Japan, May 13, 1977, 52/055764
Int. Cl.[2] F26B *7/00, 5/04*
U.S. Cl. 34—13 **7 Claims**



1. Method for cooling aged board material comprising the steps of

(A) aging board material of inorganic substance using saturated steam of high temperature and high pressure for a predetermined period of time in an autoclave;

(B) reducing the pressure in the autoclave to less than one atmosphere;

(C) maintaining said reduced pressure at about the same value until the temperature of the board material becomes about the temperature at which water does not boil at the said reduced pressure; and

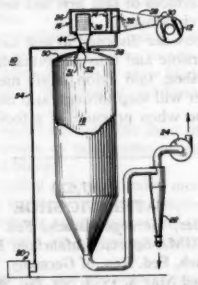
(D) removing the board material from said autoclave; wherein said reduced pressure is 110 Torr.

4,187,617

SPRAY DRYER

James J. Becker, Jr., 1205 S. 1st St., Stillwater, Minn. 55082, and Henry T. Beresford, 2243 E. Larpenteur Ave., Apt. 115, Maplewood, Minn. 55109

Filed Dec. 18, 1978, Ser. No. 970,654
Int. Cl.[2] F26B *17/10*
U.S. Cl. 34—57 R **12 Claims**



1. An improved spray dryer for transforming a liquid feed solution into a dry powder comprising:

means for supplying a continuous flow of the air required for drying;

means for heating the flow of drying air to a desired, relatively high temperature;

a drying chamber for receiving dispersed, small droplets of the feed solution and wherein the droplets are transformed into dry particles;

an air distribution system which is connected with the air supply means and which directs the flow of drying air into the drying chamber so that the air flowing into the drying chamber has substantially uniform temperature and velocity profiles;

an atomizing system which forms and introduces the dispersed droplets of feed solution into the flow of drying air as the drying air is introduced into the drying chamber;

a powder recovery system which collects the particles dried in the drying chamber and which removes the air from the spray dryer after it has passed through the drying chamber;

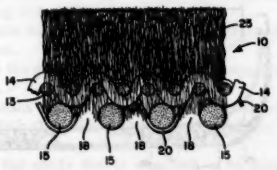
the air distribution system including a first distribution chamber having a first air flow path defined therein between a first point and a second point; means for connecting the air supply means with the first chamber adjacent to the first point so that air may flow in the first chamber along the first defined air flow path from the first point to the second point; the air heating means being disposed in the first chamber in the first defined air flow path and between the first and second points; a diffuser member having a first and second end portions, with at least the first end portion being disposed in the first chamber adjacent to the second point of the first defined air flow path, the first end portion of the diffuser including a wall having a plurality of relatively small holes therein which permit heated air flowing along the first defined air path to flow through the small holes and into the interior of the diffuser member, with the plane of the wall being disposed at an angle with respect to the first defined air flow path; and means defining a second air flow path and extending between the interior of the diffuser member and the interior of the drying chamber, with the second defined air flow path being substantially perpendicular to the first defined air flow path.

4,187,618

PAPERMAKERS' FELT

Pieter S. Diehl, Pleasant Hill, Ohio, assignor to The Orr Felt Company, Piqua, Ohio

Filed Apr. 21, 1978, Ser. No. 898,819
Int. Cl.[2] B31B *5/06*
U.S. Cl. 34—243 F **2 Claims**



1. A needled papermakers' felt for use in the press or dewatering sections of a papermaking machine or the like having improved drainage characteristics, comprising:

a woven inner fabric having warp and filling yarns,

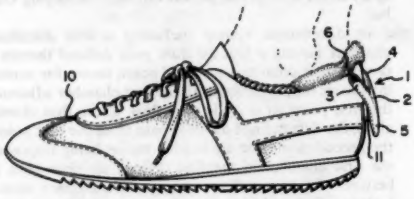
a plurality of longitudinally extending, transversely spaced relatively heavy strands positioned on the bottom surface of said fabric, the transverse spacing of said strands being related geometrically to the warp yarns with said spacing being substantially in excess of that of said warp yarns,

relatively light cross machine yarns interconnected with said strands, and

a batting of non-woven material needled into the upper surface of said fabric with a portion of said batting carried

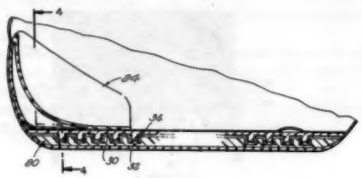
into and interlocking said strands to said fabric to provide additional stability of said strands while leaving relatively open longitudinal spaces between said strands.

4,187,619
STRAP FASTENING MEANS FOR A SOCK AND SHOE COMBINATION
Don W. Gibbs, 3452 Monte Verde Dr., Holladay, Utah 84109
Filed Mar. 6, 1978, Ser. No. 883,677
Int. Cl.[2] A43B *3/10*; A41B *11/00*
U.S. Cl. 36—10 **8 Claims**



7. A sock and shoe combination in which the sock and shoe are detachably fastened together by a connector having opposite ends and a sock fastening means on one end and a shoe fastening means on the other end, the connector being detachably fastened by a grasping element to the sock at or above its heel region and by an adhesive to the outside of the rear heel region of a shoe, such connector preventing the sock from sliding or riding into the shoe during activity by the wearer.

4,187,620
BIOMECHANICAL SHOE
Allen J. Selner, 13320 Riverside Dr. #216, Sherman Oaks, Calif. 91423
Filed Jun. 15, 1978, Ser. No. 915,642
Int. Cl.[2] A43B *13/18, 7/16*
U.S. Cl. 36—28 **9 Claims**

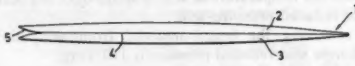


1. An athletic shoe comprising:
an upper covering;
a shoe bottom including a platform including a pair of platform members, one of said platform members defining a plurality of substantially vertical cylinder spaces disposed about said platform member, and said other platform member defining a plurality of plugs matingly aligned with said cylinder spaces, and said platform further including a plurality of coil springs disposed about said plugs to hold said platform members spaced apart in the absence of load; and
means for affixing said shoe bottom to said upper covering with said platform members aligned.

4,187,621
SHOE INNERSOLE
Leon H. Cohen, c/o Way Distributors 150 Gould St., Needham Heights, Mass. 02194
Filed Apr. 24, 1978, Ser. No. 898,935
Int. Cl.[2] A43B *13/40*
U.S. Cl. 36—44 **4 Claims**

1. Innersole for athletic shoes and the like comprising, a molded laminate of two layers completely bonded at their interface and cut and conformed in contour and varying thickness thereof to the last shape of the shoe with which the innersole is associated, the laminate having,
a relatively soft upper (towards the foot of the wearer) layer of 30–100 kilograms per cubic meter density and a compression set of 20–40% cellular plastic material and,
a lower layer of relatively hard cellular plastic material of 100–200 kilogram per cubic meter density and 1–6% compression set.

4,187,622
INNER SOLE FOR A SHOE
Fong G. Sung, No. 116, Tam Kung Rd., 1st Floor, Kowloon, Hong Kong
Filed May 8, 1978, Ser. No. 903,570
Claims priority, application United Kingdom, Jan. 12, 1978, 1274/78
Int. Cl.[2] A43B *13/38, 7/06*
U.S. Cl. 36—44 **1 Claim**

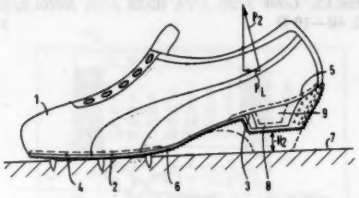


1. An inner sole for a shoe comprising:
a first layer fabricated from a nylon fabric mesh material;
a second layer fabricated from an identical nylon fabric mesh material, said first layer being identical in size, shape and contour to said second layer, said first and second layers being disposed in opposing relationship such that their contours mate and edges abut, said first and second layers being sealed together at their abutting edges such that the opposing surfaces of said first and second layers define a cavity thereinbetween;
a medicinal powder disposed in said cavity, said inner sole being reversible and thus positionable in either a left or right foot shoe, said nylon fabric mesh being sized that said powder will seep through said mesh into the interior of said shoe when pressure of a foot is exerted on said inner sole.

4,187,623
ATHLETIC SHOE
Armin A. Dassler, Herzogenaurach, Fed. Rep. of Germany, assignor to PUMA-Sportschuhfabriken Rudolf Dassler KG, Herzogenaurach, Fed. Rep. of Germany
Filed May 8, 1978, Ser. No. 903,567
Claims priority, application Fed. Rep. of Germany, May 9, 1977, 2720849
Int. Cl.[2] A43B *5/00, 13/04*
U.S. Cl. 36—129 **13 Claims**

1. A lightweight athletic racing shoe, which comprises in combination:

a very flexible outer sole, of wear-resistant material, having a forward sole region with gripping elements as well as a heel section with a clearly elevated position occupied with respect to the forward sole region; and



a heel associated with said heel section of said outer sole, the height of said heel being sufficient to impart to the wearer of said athletic racing shoe, when the wearer during forward movement places said heel on the ground, an acceleration component directed in the direction of said movement.

4,187,624

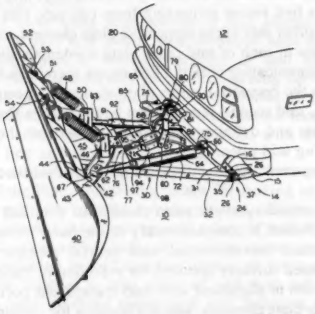
SNOW PLOW

James R. Blau, 13220 W. Burlawn Ct., Brookfield, Wis. 53003

Filed Mar. 8, 1978, Ser. No. 884,690

Int. Cl.[2] E01H *5/04*

U.S. Cl. 37—42 R **9 Claims**



1. A snow plow assembly suitable for use with a vehicle comprising:

bracket means on said vehicle for receivably accepting a plow support frame;

a plow support frame adapted for being coupled to said vehicle bracket means and including means for adjusting the angular orientation of a snow plow blade;

a plow blade coupled to the front of said frame and to said adjustment means;

bell crank means coupled between the front of said vehicle and a forward portion of said frame to permit vertical adjustment of said blade;

cylinder means including a first cylinder mounted to said frame and having a piston rod means coupled to said bell crank means for moving same to cause said vertical adjustment, and fluid means for extending and retracting said piston rod means;

first bell crank coupling bracket means mounted to said vehicle above said snow plow accepting bracket means and second bell crank coupling bracket means on said frame generally adjacent said plow blade;

said bell crank means including a first generally Y-shaped link member the base of which is coupled to said first bell crank coupling bracket means and a second generally L-shaped link member having first and second sides, the end of said first side being coupled between the free ends of said first link member and the free end of said second side being pivotally coupled to said piston rod of said first cylinder, the angular corner of said second link member being pivotally coupled to said second bell crank coupling bracket means.

4,187,625

SYSTEM FOR EXCAVATION AT SEA THROUGH HORIZONTAL GUIDING BY MEANS OF CABLES

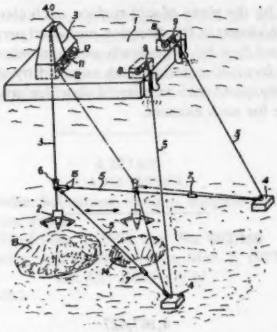
Jean J. Duval, Paris, France, assignor to Compagnie Francaise des Petroles, Paris, France

Filed Mar. 20, 1978, Ser. No. 888,448

Claims priority, application France, Mar. 21, 1977, 77 08421; Mar. 1, 1978, 78 05832

Int. Cl.[2] E02F *3/44*

U.S. Cl. 37—71 **21 Claims**



1. An underwater excavation system comprising:

(a) an excavation means;

(b) a carrying line therefor;

(c) means connecting said excavation means to said carrying line;

(d) a support station on the surface fixed in a position generally above a dumping site on the seabed;

(e) lifting means mounted on the support station for controlling the length of the carrying line;

(f) at least one guide line;

(g) connecting means fixedly connecting the guide line to said carrying line,

(h) fixed position means located on the seabed near the site to be excavated,

(i) a winch for the guide line mounted on the support station, and

(j) sheave means mounted on the fixed position means through which the guide line passes to run from the connecting means to the guide line winch,

(k) whereby the guide line is winched in to position the excavation means above the excavation site, and slackened to allow the excavation means to gravationally swing over to the dumping site.

4,187,626

EXCAVATING TOOL HAVING HARD-FACING ELEMENTS

Donald J. Greer, Danville, Ill., and John D. MacEwan, Jr., Portland, Oreg., assignors to ESCO Corporation, Portland, Oreg.

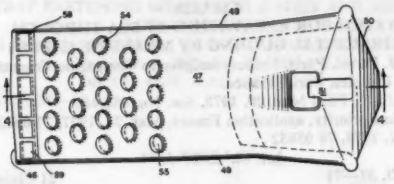
Filed Feb. 27, 1978, Ser. No. 881,724

Int. Cl.[2] E02F *9/28*

U.S. Cl. 37—141 R **4 Claims**

1. In a tool for excavating, a unitary metal member having a material engaging edge at one end and a mounting means

spaced from said one end, said member having a generally planar material engaging surface extending generally from said one end, and a plurality of wear resistant elements mounted in said surface, the improvement characterized by the fact that each element has a generally planar outer face disposed at an angle to said surface, the outer face of each wear element being



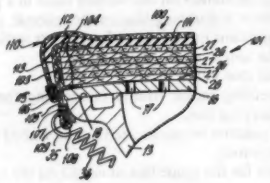
intersected by the plane of said surface, each element being of a uniform thickness in the direction measured perpendicular to said face, said face being generally perpendicular to the average line of force of material being engaged by said tool, said tool being equipped with an integral shoulder upstanding from said surface for each element.

4,187,627

PADS FOR BUCKS OF GARMENT PRESSING MACHINES

Jerome H. Cohen, Bayside, N.Y., assignor to Burtest Products Corp., New York, N.Y.

Filed Jul. 13, 1978, Ser. No. 924,191
Int. Cl.[2] D06F *81/14, 83/00*
U.S. Cl. 38—66 **6 Claims**



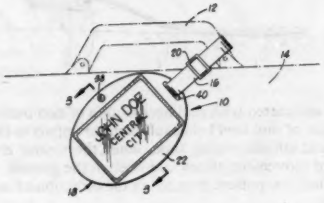
1. A buck pad to be placed on a perforated plate of a buck of a garment pressing machine, said pad comprising a sub-pad, said sub-pad comprising one or more pairs of layers, each pair comprising upper and lower superposed layers of textile material, said lower layers having relatively loosely integrated threads and said upper layers having relatively closely integrated threads, all said layers comprising high temperature resisting material, a binding stitched to the edges of said layers and a skirt stitched to said binding and extending down therefrom, said binding and skirt being made of high temperature resisting material, a cover pad on the sub-pad, said cover pad comprising a layer of soft resilient material, thicker than each layer of said pair or pairs of layers, placed over the top most layer of said sub-pad, and a top cover of relatively closely integrated threads, over said soft resilient layer and having a skirt extending downwardly and provided with means to attach said cover pad to said sub-pad, said top cover being made of high heat resisting material.

4,187,628

IDENTIFICATION DEVICE

Howard J. Thompson, 4300 N. Barnes, Apt. 108, Oklahoma City, Okla. 73112

Filed Jun. 23, 1977, Ser. No. 809,084
Int. Cl.[2] G09F *3/20, 3/14*; B32B *3/06*; A47G *1/12*
U.S. Cl. 40—10 D **1 Claim**



1. An identification device comprising:

a pair of synthetic resin outer plate elements of complementary elliptical configuration each including a transparent portion, each of said outer plate elements further characterized in having a rectangular opening positioned centrally therein and extending therethrough and constituted by a first recess projecting from one side thereof toward the other side of the respective plate element, and a second recess in each of said outer plate elements registering and communicating with the first recess therein and projecting into the respective outer plate element opposite said first side, said second recess being larger in area than said first recess and defining therewith a peripheral shoulder bordering said opening;

a transparent window disposed in each of said second recesses;

a flat central synthetic resin element of elliptical configuration which is complementary to the outer elements and is disposed therebetween, said central element including opposed surfaces textured for retention of indicia marked thereon in alignment with said transparent portion of said outer plate elements, and in a position for viewing through said transparent windows;

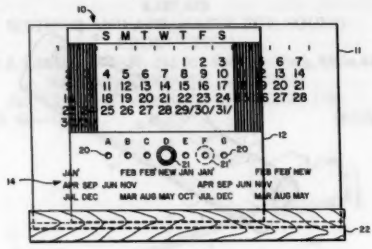
fastening means extending through said outer plate elements and said flat central element at a location on one of the major or minor axes of the outer plate elements and central element, and interconnecting said outer and central elements in overlapped, superimposed abutting contact for pivotation about a common axis located adjacent a peripheral edge of each of the elements and on said axes to facilitate movement of said plate elements and central element between registering, superimposed positions, and positions in which said elements are out of alignment with each other, said outer plate elements and central element each further including a slot formed therethrough and located on the other major or minor axis of the respective elliptical element from that upon which said fastening means is located, said slots being dimensioned and positioned for alignment with each other when said outer elements and central elements are in registering, superimposed positions, said fastening means comprising frictionally engaged, quick releasable cooperating male and female fastener elements; and

a flexible securing element detachably connected to said outer and central elements by extension through said aligned slots therein.

4,187,629
PERPETUAL AND MULTI-YEAR CALENDARS

Yoshikazu Yamada, Irvine, Calif., assignor to Yamada-Graphics Corp., Costa Mesa, Calif.

Filed Sep. 15, 1977, Ser. No. 833,522
Int. Cl.[2] G09D 3/10
U.S. Cl. 40—109 31 Claims



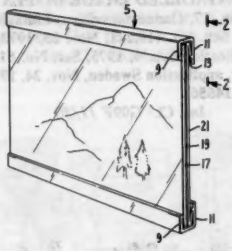
1. A perpetual calendar comprising in combination:
first means bearing first calendar data;
second means movable relative to said first means and bearing second calendar data;
one of said first and second calendar data comprising indications of the days of the week by name, and the other of said first and second calendar data comprising indications of the days of the month by number;
one of said first and second calendar data being multiply listed, and the other of first and second calendar data being singly listed;
means for controlling adjustments of said second means relative to said first means in accordance with different occurring calendar interrelationships of said first and second calendar data each month, comprising third calendar data including indications of the months of the year associated with one of said first and second means and corresponding indexing means associated with the other of said first and second means; and
means for extending the usability of the calendar to an indefinitely long time, comprising means for making an adjustment each year of said indexing means relative to said third calendar data and to said other of said first and second means with which said indexing means are associated, including in said indexing means an index element movable relative to said other of said first and second means, said indexing means and said indexing element comprising a removable marker which further aids in said relative moving of said first and second means, including in said third calendar data an indication representing January of any year located in terms of an indexing position associated with the year preceding the particular year, and being separate and distinct from an indication of January of said preceding year.

4,187,630
PICTURE FRAME

Joe D. Giulie, and James E. Guilie, both of 1015 Corporation Way, Suite D, Palo Alto, Calif. 94300

Filed Jan. 6, 1978, Ser. No. 867,224
Int. Cl.[2] G09F 1/12
U.S. Cl. 40—156 3 Claims

1. A picture having a frame wherein a "U" shaped frame member forms the edge on a sheet of bendable, stiff material, said picture comprising in combination:
a. a "U" shaped edge member,
b. said "U" having a pair of arms extending upwardly from a bight,
c. an inwardly extending member on one of said arms spaced from said bight and extending toward, but terminating short of, the opposite arm,
d. a sheet of bendable, stiff material,
e. said sheet of material being folded parallel to a terminal edge to provide a fold line,
f. said fold line resting against said bight,

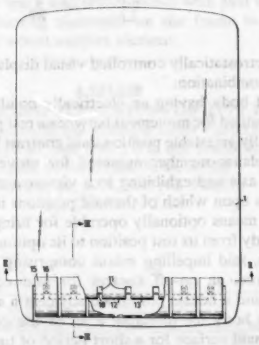


g. said terminal edge springing out from the main body of the sheet and resting against the corner formed between the inner side of said inwardly extending member and the arm of the "U" from which said member extends,
h. whereby said sheet is locked in said "U" shaped edge member.

4,187,631
CARD INDEX

Ernst E. Zandelin, Sollentuna, Sweden, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 1, 1978, Ser. No. 882,460
Claims priority, application Sweden, Mar. 2, 1977, 7702299
Int. Cl.[2] B42F 17/34
U.S. Cl. 40—381 10 Claims



1. In a card index, a flat casing having a top, side walls and a front opening, a tray mounted to be pushed into and pulled out of the casing through said opening, said tray having a step between a rear part and a front part thereof, a pile of index cards supported on said tray and intended to have information written thereon, the front margins of said cards extending beyond said step, manually operable means for determining, before pulling out said tray, which index card is to be presented to an operator, said means comprising manually depressible keys in a number corresponding to the number of index cards in said pile and dog means on said keys adapted at the depression of said keys to pass down through corresponding cutouts in the front margin of the casing top and at some distance in front of said step to bend down towards the front portion of the tray, the front portion of a number of said index cards corresponding to optionnally selected keys, thereby causing the remaining index cards lying thereabove to be pressed upwards into engagement with the inside of said casing top, and catch means at the underside of said casing top between said cutouts

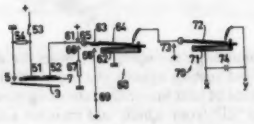
therein to stop said remaining index cards when pulling out said tray together with the bent-down index cards.

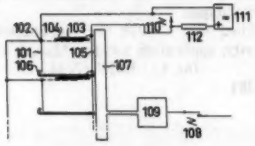
4,187,632

REMOTE CONTROLLED IMAGE DISPLAY DEVICE

Hans F. Rydström, 17, Dannemansvägen, Lidingö, Sweden

Continuation of Ser. No. 418,221, Nov. 23, 1973, abandoned.
This application Sep. 4, 1975, Ser. No. 610,409
Claims priority, application Sweden, Nov. 24, 1972, 15309/72; Oct. 29, 1973, 7314656
Int. Cl.[2] G09F *11/30*
U.S. Cl. 40—446 2 Claims





1. An electrostatically controlled visual display device comprising, in combination:

a contrast body having an electrically conductive portion and mounted for movement between a rest position and an optionally arrestable position, said contrast body comprising a planar member mounted for movement about a pivotal axis and exhibiting to a viewer a contrast which depends upon which of the said positions it occupies;

impelling means optionally operable for bringing said contrast body from its rest position to its optionally arrestable position, said impelling means comprising a compressed air source, an on-off control for said compressed air source and a nozzle positioned adjacent a surface of said contrast body for directing a jet of the compressed air against said surface for a short period of time;

electrostatic arresting means sufficient to retain said contrast body in said optionally arrestable position after being brought to said optionally arrestable position by said impelling means, said electrostatic arresting means comprising a fixed electrode and a movable electrode constituted by said electrically conductive portion of said contrast body which is brought into a position adjacent to but spaced from said fixed electrode to establish an electrostatic attractive force therebetween; and

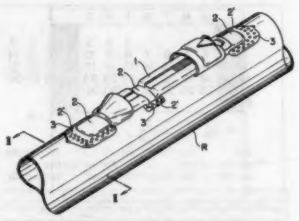
means optionally operable for energizing and de-energizing said electrostatic arresting means comprising a voltage source to which said fixed and movable electrodes are connected through a charging resistor and relay controlled switch means for closing a discharge path directly between said electrodes and which serves to eliminate the electrostatic attractive force therebetween, said contrast body being self-restorable to its rest position when said electrostatic arresting means is in its de-energized state.

4,187,633

REEL SEAT FOR FISHING RODS

Ryuichi Ohmura, Shizuoka, Japan, assignor to Fuji Kogyo Co., Ltd., Japan

Filed Feb. 7, 1978, Ser. No. 875,923
Int. Cl.[2] A01K *87/06*
U.S. Cl. 43—22 1 Claim



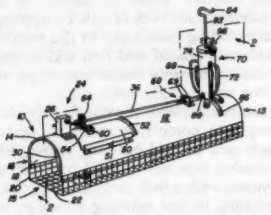
1. A reel seat for fishing rods having a foot protruding from each end thereof, wherein each foot has multiple holes perforated therein, is made thinner than the reel seat, and is formed of a separate piece of metal.

4,187,634

ANIMAL TRAP FOR CAPTURING BURROWING ANIMALS

Glenn W. Kintz, 3306 Ammon Way, Forest Grove, Oreg. 97116

Filed May 18, 1978, Ser. No. 907,288
Int. Cl.[2] A01M *23/20*
U.S. Cl. 43—61 9 Claims



1. A trap for capturing burrowing animals which is disposable within a tunnel formed by said animals, the trap comprising:

a body member having an open entry end and an end opposite said entry end, and including upper and lower roof and floor portions, respectively;

a trigger mechanism disposed near the opposite end of the body member, the trigger mechanism including a transverse trigger plate disposed within the interior of the body member in the path an animal would follow through the trap, the trigger mechanism further including means for mounting the trigger plate for pivotal movement and a trigger rod carried by the mounting means at one end of said trigger rod;

gate means carried by the body member for closing the entry end of the body member, the trigger rod extending longitudinally of the body member to engage the gate means when the trap is in a set conformation; and,

spring means carried by the body member for holding the gate mean under tension in the set conformation, displacement of the trigger rod on pivotal movement of the trigger releasing the gate means to allow the spring means to force said gate means into a position blocking the entry end of the body member, said trigger plate having a pad of

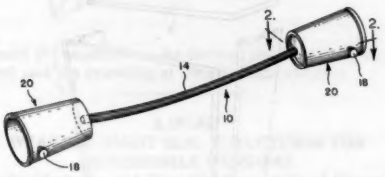
soft material disposed on the side thereof opposing said open entry end.

4,187,635

METHOD AND APPARATUS FOR SOUND PRODUCTION

Robert J. Deissler, 4540 W. 213 St., Fairview Park, Ohio 44126

Filed Apr. 3, 1978, Ser. No. 892,822
Int. Cl.² A63H *5/00*; G10D *13/08*; G08B *1/00*
U.S. Cl. 46—174 **16 Claims**



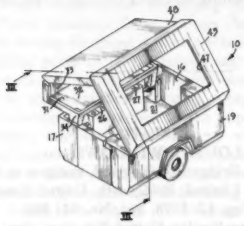
1. An apparatus for producing sound effects comprising:
two diaphragms;
a resonator affixed to each diaphragm;
a helically-coiled spring positioned between and attached to the diaphragms whereby said diaphragms can be moved with respect to each other to induce spring, diaphragm, and resonator vibrations, said spring having a lowest resonance frequency less than 18 hertz; and
at least one support member affixed to each resonator whereby each resonator can be supported vibrations without substantially muffling the vibrations of each resonator.

4,187,636

CAMPING TRAILER

Ronald R. Pauly, Mound, Minn., assignor to Tonka Corporation, Spring Park, Minn.

Filed Sep. 9, 1977, Ser. No. 831,861
Int. Cl.² A63H *11/10*
U.S. Cl. 46—201 **4 Claims**



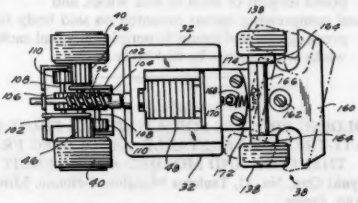
1. A toy camping trailer including a pair of wheels rotatably mounted on an axle, a box supported on said axle, a top means associated with said box, said top means including a first member and a second member, said first member being pivotably mounted along one edge to said box, and including a play access opening through which a child may insert and remove toy figures, said second member being pivotably mounted to the opposite side edge of said first member, said second member being pivotable from a first position aligned with said first member to a second position supported adjacent the opposite edge of said box, said second member serving to close said play access opening when in said aligned position.

4,187,637

TOY VEHICLE

Edwin A. Nielsen, Oceanside, N.Y., assignor to Ideal Toy Corporation, Hollis, N.Y.

Division of Ser. No. 783,849, Apr. 1, 1977, Pat. No. 4,109,913, which is a division of Ser. No. 747,441, Dec. 6, 1976, abandoned.
This application Oct. 11, 1977, Ser. No. 841,226
Int. Cl.² A63H *17/36*
U.S. Cl. 46—262 **13 Claims**



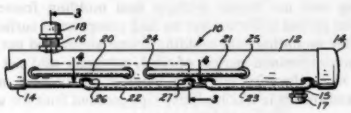
1. A toy vehicle adapted for use on a track having side walls and including a frame, a pair of drive wheels, a drive motor in said frame, transmission means for selectively driving one or the other of said drive wheels to steer said vehicle to the right or left, and a shock absorbing wheel mount on said frame including a one piece wheel support element pivotally mounted on said frame, a pair of wheels both of which are rotatably mounted on said wheel support element; and spring means engaged between said support element and said frame for biasing said wheel support element into a normal, central position on said frame; said wheel support element including integral bumper surfaces extending beyond opposite sides of said frame; whereby when said bumper surfaces engage the side walls of the track said wheels move with said wheel support element pivoting therewith on the frame in the same direction as said wheel support element.

4,187,638

METHOD AND APPARATUS FOR APPLYING CHEMICALS TO WEEDS AND PLANTS

James H. Hardy, P.O. Box 259, Tr. 2, and James E. Roberson, 220 Bates St., both of Batesville, Miss. 38606

Filed Sep. 26, 1978, Ser. No. 945,875
Int. Cl.² A01N *5/00*
U.S. Cl. 47—1.5 **25 Claims**



1. Apparatus for applying a chemical to plants comprising
an elongate hollow body having an inside for containing a plant treating liquid, and an outside;
means for introducing a plant treating liquid into said body;
wick means on said body for applying the plant treating

liquid to plants to be treated by contact of the wick means with the plants, said wick means comprising:

a plurality of wicks supported by the body and having exposed lengths extending along the outside of said body, each such wick having an unexposed length extending from each end of the exposed length and forming a continuation of the exposed length, said unexposed lengths communicating with the interior of said body,

peripheral seal means between said exposed and unexposed lengths of each of said wicks, and

seal compressing means mounted on said body for compressing said seal means to peripherally seal each of said wicks with respect to said body.

4,187,639

MOLDING PROCESS FOR A NATURAL FRUIT OF A FRUIT-TREE OR VEGETABLE, A MOLDING FRAME THEREFOR AND MOLDED ABOVE FRUIT

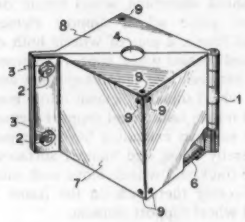
Tomoyuki Ono, No. 31, Tsukasa Mansion, 1-chome, Minato-ku, Tokyo, Japan

Filed Feb. 17, 1978, Ser. No. 878,909

Claims priority, application Japan, Mar. 3, 1977, 52-022193

Int. Cl.[2] A01G *1/00*

U.S. Cl. 47—58 **3 Claims**



1. A molding process comprising the step of mounting a transparent molding frame about an immature natural net melon whose compressed surface would be injured after removing the molding frame from the net melon after it is molded, said frame being mounted about the net melon before growth of the met melon is completed and having a molding inner shape of an inner size sufficiently large to permit further growth of the net melon therewithin and small enough to shape the resultant fruit, and said method further comprising growing said net melon without said molding frame for a sufficient period to form a net on said compressed surface, and thereafter mounting said molding frame about said net melon for a predetermined period of time, whereby said net melon grows in conformity with the inner shape of said molding frame and results in a completely ripe molded fruit for use as a food.

4,187,640

COMPLETE DOOR SET

Erik Freilev, Blaakildevej 12, DK-5634Sandager, Denmark

Filed Feb. 9, 1978, Ser. No. 876,516

Claims priority, application Denmark, Feb. 18, 1977, 693/77

Int. Cl.[2] E06B *1/00*; E05D *7/02*

U.S. Cl. 49—380 **1 Claim**

1. A reversible door set assembly, comprising:

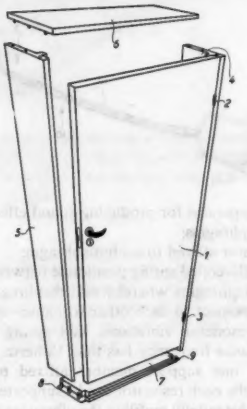
a door having upper and lower hinge mounting portions on one vertical edge thereof, with a distance d between the center of said upper portion and the top of the door and a distance e between the center of said lower portion and the bottom of the door;

first and second vertical side jamb members, said first member having two spaced hinge mounting areas on one vertical surface thereof, with a distance a_1 between the center of one of said areas and the adjacent first end of the jamb and a distance a_2 between the center of the other of said areas and the adjacent second end of the jamb opposite said first end thereof;

a horizontal sill member comprising a sill plate extending between said jamb members and having a height g and a bottom recess of height p for receiving a horizontal supporting plate, with a desired clearance f between the bottom of said door and the top of said sill;

a horizontal head member extending between said jamb members with a desired clearance c between the top of said door and the bottom of said head member;

wherein a_1 is approximately equal to a_2, d and e are both less



than the smaller dimension of a_1 and a_2, and $c+d=e+f+g-p$;

dowel joint means for connecting said sill and head members to said side jamb members, said means comprising dowels extending from said sill and head members and corresponding dowel holes in said side jamb members; and

insertion hinge means connecting said door member and said side jamb members, and reversible lock means mounted on said door member, to permit said door set to be changed from a left-hinged door to a right-hinged door without remounting said hinge means, by inverting said first jamb member and rotating said door through a 180° angle about a vertical axis. /

4,187,641

LOUVRE WINDOWS

Norman Thompson, Bridgnorth, England, assignor to Beta Aluminium Products Limited, Bridgnorth, United Kingdom

Filed Sep. 12, 1978, Ser. No. 941,808

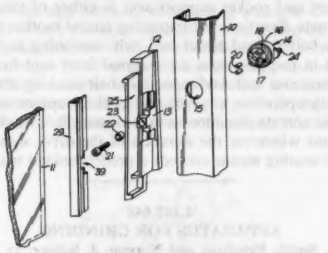
Claims priority, application United Kingdom, Sep. 15, 1977, 38487/77

Int. Cl.[2] E06B *7/08*

U.S. Cl. 49—403 **8 Claims**

1. A blade holder for a louvre window comprising an elongated member, means on the elongated member for retaining an end edge of a louvre blade, a rebate of non-circular cross-section formed in that surface of the elongated member which, in use, is disposed adjacent the surface of a window frame on which the blade holder is pivotally mounted, a drive plate for pivotally mounting the elongated member on the window frame, said drive plate comprising a main body and a boss separated by a bearing portion, the bearing portion being adapted for rotational engagement within an aperture in the

window frame, and the boss having a configuration such that it has a driving engagement with said rebate, and at least one



hardened pin mounted on the driving plate to extend axially thereof, said pin extending at least through said boss.

4,187,642

WEATHER-TIGHT SEAL STRUCTURES FOR AUTOMOBILE WINDOWS

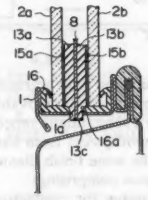
Teruhiko Morinaga, and Ikuo Nishikawa, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed May 31, 1978, Ser. No. 911,150

Claims priority, application Japan, May 31, 1977, 52-70859[U]

Int. Cl.[2] E05D *15/16*

U.S. Cl. 49—406 **6 Claims**



1. In a double sliding window structure for a motor vehicle which comprises window frame means having upper and lower run channel means, two window glass panels substantially parallel to each other throughout areas thereof and mounted on said frame means for sliding movement between open and closed positions along the run channel means, said glass panels having marginal portions which are coextensive with remaining portions of the panels and overlapped each other in the closed position, the improvement comprising a weather-tight seal structure including elongated seal means extending between and attached to the upper and lower run channel means, said seal means having resilient sealing lip means which extends substantially throughout the length of the seal means and is always in slidable and sealing engagement with the window glass panels, said sealing lip means having upper and lower ends which are in close contact with the upper and lower run channel means respectively.

4,187,643

WINDOW AND DOOR FRAME ASSEMBLY ADAPTED TO FACILITATE INSTALLATION AND REMOVAL OF WINDOW PANES

Thomas Sconzo, 141 Macon St., Sayville, N.Y. 11782

Filed Nov. 17, 1978, Ser. No. 961,677

Int. Cl.[2] E05D *15/06*

U.S. Cl. 49—455 **10 Claims**

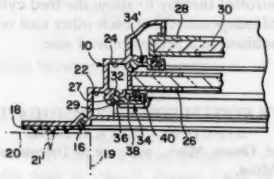
1. A window frame assembly, comprising:

a pair of side frame members;

a pair of end frame members joined to ends of said side frame members to define a rectangular frame for supporting at least one sash;

a tubular channel integrally formed with one frame member of one of said pairs of frame members, and extending for substantially the length of said frame member, said channel having a lateral slot therein;

a spline member having a cylindrical bead rotatably and slidably engaged in said channel, and having a blade portion extending through said slot and for the length of said channel for retaining said sash in said window frame;



spring means in said channel bearing against one end of said spline member urging the same lengthwise along said channel; and

a pocket formed in a member of the other pair of frame members adjacent said one frame member and having a configuration which prevents rotation of said spline member when the other end of said spline member is seated in said pocket and for releasing said other end of said spline member, whereby said spline member can be moved longitudinally against the bias of said spring means to release said spline member, so that said sash can be readily installed and removed.

4,187,644

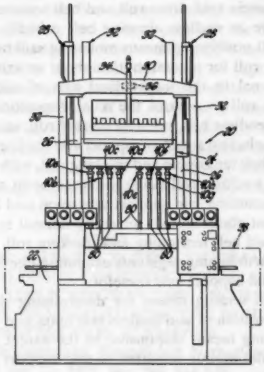
DUAL FEED APPARATUS FOR MULTIPLE SPINDLE HONING MACHINE

Paul Fitzpatrick, Southfield, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Jun. 26, 1978, Ser. No. 919,198

Int. Cl.[2] B24B *5/08*

U.S. Cl. 51—34 D **32 Claims**



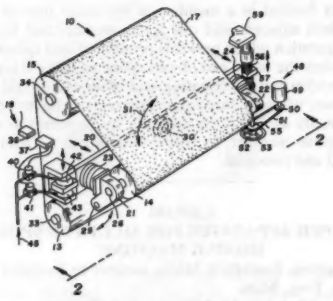
1. In a multiple spindle honing machine including a base, a spindle head mounted on the base for reciprocally driven movement with respect thereto, a plurality of rotatable spindles mounted on the head for reciprocation therewith, each spindle including an expandable and contractable honing tool for simultaneously machining a plurality of bores, and a drive train for rotating the spindles, improved feed apparatus com-

prising: feed cylinders mounted on the head in respective association with the honing tools; each spindle including a connector that connects one of the feed cylinders and the associated honing tool such that operation of the feed cylinders provides an initial expansion of the tools after insertion thereof into the bores; mechanical locks for respectively locking the feed cylinders after the initial tool expansion; a constant rate feed mechanism for continuing to expand all of the tools after the feed cylinders are locked; and control means for individually sensing the size of each bore being machined and for operating the associated mechanical lock to unlock the feed cylinder controlled thereby to allow the feed cylinder to contract the tool independently of each other tool when the bore has been machined to a predetermined size.

4,187,645
REACTIVE SYSTEM FOR ACCOMMODATING BELT STRETCH AND TRACKING

Fred W. Lind, Osseo, Minn., assignor to Timesavers, Inc., Minneapolis, Minn.

Filed Jul. 26, 1978, Ser. No. 928,173
Int. Cl.² B24B *21/18*
U.S. Cl. 51—135 BT **1 Claim**



1. In combination with a belt-type abrading machine comprising a frame, a drive roll and a belt tensioning and tracking roll, wherein said drive roll and belt tensioning and tracking roll drive an endless abrasive belt orbitally along a defined path; belt positioning means mounting said belt tensioning and tracking roll for pivotal motion about an axis arranged generally normal to the longitudinal axis of said tensioning and tracking roll to control the axial disposition of an orbitally moving endless belt mounted on said roll; said belt positioning means including a rocker support arm for journalably supporting said belt tensioning and tracking roll, with said belt tensioning and tracking roll being mounted upon said support arm; means mounting said support arm upon said frame for pivotal movement about an axis generally normal to the longitudinal axis of said belt tensioning and tracking roll, with said rocker support arm having segments extending laterally outwardly of the pivotal support axis therefor:

(a) first sensing means for determining the axial tracking disposition of said endless belt upon said rolls, and second sensing means responsive to the extent and direction of pivotal motion imparted to said support arm by said first sensing means;

(b) primary belt tracking drive means for reflecting the pivotal motion of said rocker support arm and responsive to signals from said first sensing means;

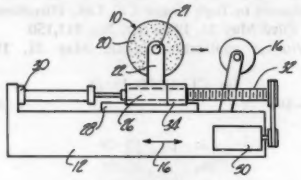
(c) secondary belt tracking drive means for effecting pivotal motion of said rocker support arm upon the continuous actuation of said primary belt tracking driver means for a certain predetermined time period, with said secondary belt tracking drive means being disposed in opposed relationship to said primary belt tracking drive means with respect to the rocker support arm pivot mount;

(d) said primary belt tracking drive means being operative to pivot said rocker support arm in either of two opposed arcuate directions for imparting lateral motion to an endless belt trained about said belt tensioning and tracking roll in response to a drive signal from said first sensing means, and with said secondary belt tracking drive means being operative to pivot said rocker support arm in the same arcuate direction as said primary belt tracking drive means whenever the duration of the drive signal of said first sensing means exceeds a predetermined magnitude.

4,187,646
APPARATUS FOR GRINDING

David L. Smith, Brighton, and Norman J. Scherr, Jr., Warren, both of Mich., assignors to The Valeron Corporation, Oak Park, Mich.

Division of Ser. No. 714,405, Aug. 16, 1976, Pat. No. 4,150,513.
This application Oct. 4, 1977, Ser. No. 839,196
Int. Cl.² B24B *49/16*
U.S. Cl. 51—165.77 **8 Claims**



1. For use in combination with a grinder of the type having a wheel and a workpiece spindle movable relative to one another and operable in a substantially repetitive fashion to grind a production run of workpieces from varying starting diameters to substantially the same finish diameter;

a controller apparatus comprising:

electronic gauge means for contacting the workpiece to provide signals representing the diameter of the workpiece;

controllable motor means operatively connected to produce relative feed motion between the wheel and spindle at speeds and in directions determined by the character of signals input thereto; and

a programmable computer means operatively electrically connected in signal transfer relationship between the gauge means and the motor means, said computer means having storage means containing a plurality of control signals representing feed rate profiles for a given time period and being responsive to a starting diameter signal to retrieve the control signal of such character which, when applied to the motor means, automatically effects a grind cycle to achieve said finish diameter in said given time period irrespective of variations in the starting diameter.

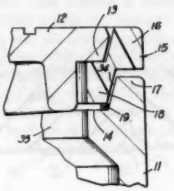
4,187,647
MANHOLE EXTENDER ELEMENTS

John R. Hall, Atlanta, Ga., assignor to Margaret T. Hall, Atlanta, Ga. and James B. Turner, Jr., Raleigh, N.C.

Filed Oct. 25, 1977, Ser. No. 844,649
Int. Cl.² E02D *29/14*
U.S. Cl. 52—20 **16 Claims**

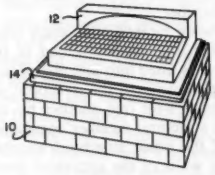
1. A manhole extender ring adapted for seating on a manhole structure below pavement level for the purpose of elevating a manhole cover substantially to a newly laid pavement level, said extender ring being unitary and having an inwardly recessed seating surface for receiving a manhole cover such that

when said manhole cover is placed upon said seat, a portion of said ring surrounds said manhole cover and an upper surface of said ring will be at about the level of the upper surface of said manhole cover, said extender ring having a height about the upper level of said manhole structure for retaining the newly laid paving material above the level of the manhole structure, said ring having a lower portion for projecting into the upper opening of said manhole structure, said lower portion having spaced flat annular radial upper and lower surfaces and a frusto conical downwardly tapered outer wall joining the inner pe-



riphery of the upper surface of said lower portion and the outer periphery of the lower surface of said lower portion, said upper and lower surfaces of said lower portion and said outer wall of said lower portion conforming generally to the shape and dimensions of said manhole structure for seating on the upper and inner edge portions thereof, and said extender ring being composed essentially of plastics material which has a melting point well above the application temperature of asphalt paving material but will soften somewhat at such application temperature.

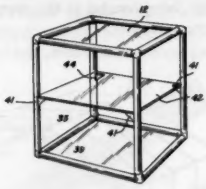
4,187,648
FORM FOR A MORTAR CAP
Raymond F. Hahn, 11 First St., Mine Hill, N.J. 07801
Filed Apr. 6, 1978, Ser. No. 893,943
Int. Cl.[2] E02D *29/14*; E04G *15/06*
U.S. Cl. 52—21 **10 Claims**



1. A form for a mortar cap, for receiving cementitious materials therewithin, such as cement, mortar, and the like, to define a footing for a catch basin grating, comprising:
at least first means defining multilateral, walled channels for receiving cementitious materials therewithin; and
means fixed adjacent to said channels and projecting from said first means for pilotingly aligning said channels with a top course of a catch basin.

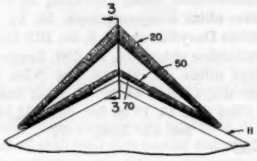
4,187,649
FRAME CONSTRUCTION
William H. Chaffee, Chicago, Ill., assignor to Technical Exhibits Corporation, Chicago, Ill.
Filed Jul. 26, 1978, Ser. No. 928,085
Int. Cl.[2] A47B *5/00*
U.S. Cl. 52—36 **8 Claims**

6. The frame construction of claim 1 wherein said frame construction further includes a shelf support having an insert portion received between the inturned ends of an upright edging element free of a panel edge therein at a position spaced above the corner element, and a shelf support portion extending from the insert portion, said insert portion having a thickness preselected to provide an effective frictional retention of



the insert portion between said inturned ends of the edging element.

4,187,650
CONSTRUCTION UNIT
James E. Poplin, 3466 W. Magill, Fresno, Calif. 93705
Filed Mar. 13, 1978, Ser. No. 885,615
Int. Cl.[2] E04B *7/00*
U.S. Cl. 52—57 **7 Claims**



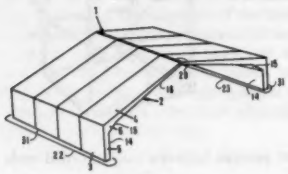
1. A construction unit comprising an envelope having a forward portion, bottom panels folded toward each other to define an interior for the envelope and an upper panel folded rearwardly at said forward portion into said interior to impart increased rigidity to the upper panel at said forward portion and wherein said upper panel is folded along a longitudinal axis extending at approximately right angles to the forward portion of the envelope; and an insert disposed within the interior of the envelope adjacent to said forward portion and captured by the bottom panels, wherein said bottom panels at the forward portion of the envelope are folded rearwardly toward the interior of the envelope and about the insert to capture the insert within the interior at the forward portion of the envelope and wherein said bottom panels of the envelope are slidable to and from each other along the insert whereby the distance between said longitudinal axis of the upper panel and the insert can be increased and alternatively decreased by sliding the bottom panels toward and alternatively from each other.

4,187,651
METHOD FOR MANUFACTURING THERMALLY INSULATED BUILDINGS, CONSTRUCTION ELEMENTS SUITABLE FOR APPLICATION IN THIS METHOD AND A METHOD OF MANUFACTURING THE BUILDING CONSTRUCTION ELEMENTS
Auke Tolsma, Polarisstraat 48, Emmeloord, Netherlands
Filed Jul. 12, 1977, Ser. No. 814,925
Claims priority, application Netherlands, Jul. 15, 1976, 7607840
Int. Cl.[2] E04C *3/02*
U.S. Cl. 52—79.1 **7 Claims**

1. A thermally insulated building construction element in the form of a half truss of plate truss shape comprising:
a polyurethane hard foam core having an outer arch side, an inner arch side, two lateral sides, and a weight per unit volume of at least about 30 kg/m^3 wherein the density and

strength of the hard foam core in the angular region of the element are greater than the density and strength of the core adjacent to the ends of the element.

a bent plate outer lining bonded to the outer arch side of the hard foam core; and



a bent plate inner lining bonded to the inner arch side of the hard foam core, the lateral sides of the building construction element being unlined.

4,187,652

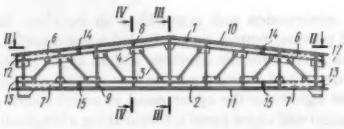
SPACE STRUCTURE OF A ROOF COVERING FOR A BUILDING

Anatoly P. Bobrovnikov, ulitsa Usacheva, 25, kv. 91; Alexandr V. Zakharov, ulitsa Kooperativnaya, 10, kv. 8; Gennady I. Soloviev, ulitsa Davydkovskaya, 6, kv. 102; Gennady G. Mikhailov, Mozhaiskoe shosse, 24, kv. 298; Tamara N. Golubeva, Gvardeiskaya ulitsa, 13, kv. 19, and Nina N. Glushkova, Malaya Filevskaya ulitsa, 48, kv. 58, all of Moscow, U.S.S.R.

Filed Sep. 14, 1978, Ser. No. 942,148

Int. Cl.[2] E04C *3/02*

U.S. Cl. 52—90 **7 Claims**



1. A space structure of a roof covering for a building, incorporating: at leat two roof trusses, each comprising a top longitudinal chord and a bottom longitudinal chord, diagonal rods and vertical posts, by means of which said top chord is connected with said bottom chord; cross braces located in the vertical planes of cross-section of said space structure, said cross braces serving to interconnect said roof trusses and being mounted at the ends of said structure and in the intermediate planes of cross-section between the structure ends at distances sufficient to ensure lateral rigidity of said structure; top and bottom abutment girder members provided at the ends of said top and bottom chords, respectively, and top and bottom purlins arranged between said top and bottom abutment girder members, respectively, at the same levels therewith in panel points of said trusses, said top and bottom abutment girder members and top and bottom purlin being connected to the top and bottom chords, respectively; a top prestressed sheet covering and a bottom prestressed sheet covering, supported by the top and bottom abutment girder members and purlins, respectively, and attached to said members and purlins and to said top and bottom chords, respectively, said top and bottom abutment girder members keeping said respective top and bottom sheet coverings tensioned and said respective top and bottom chords compressed; top and bottom flanges for securing said space structure to external means by which said top and bottom sheet coverings are tensioned, said flanges attached to the end faces of said top and bottom chords, respectively; said space structure wherein said top and bottom chords are made sectional lengthwise, with the connection between the sections of the top chords as well as the sections of the bottom chords made rigid.

4,187,653

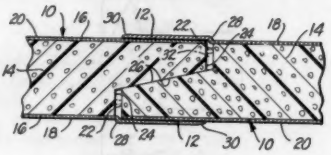
STRUCTURAL MEMBERS AND JOINTS BETWEEN SUCH MEMBERS

Aron Kliewer, Jr., Blue Jay, Calif., assignor to Fleetwood Enterprises, Inc., Riverside, Calif.

Filed May 5, 1978, Ser. No. 903,078

Int. Cl.[2] E04C *2/20;* **E04B** *2/08*

U.S. Cl. 52—98 **13 Claims**



1. A structural member constructed so as to include a flat core having sides, a first side member and a second side member, said side members being located against and secured to said sides of said core, said structural member having an end in which the improvement comprises:

the end of said core adjacent to said end of said structural member including a first spacing wall located adjacent to said first side member, a second spacing wall located adjacent to said second side member, and a sloping wall located between and connecting said first and second spacing walls,

said spacing walls extending inwardly from said side members toward the center region of said structural member located between said side members,

said first spacing wall being located further from said end of said structural member than said second spacing wall,

said first side member extending a sufficient distance from said first spacing wall so as to be capable of overlying the second side member of the end of another corresponding structural member which has been fitted into said end of said structural member,

said sloping wall being located at an angle relative to said side members such that when the end of such another structural member is fitted into said end of said structural member the sloping walls of the structural members are held in engagement with one another by the first side member of each structural member engaging the second side member of the other structural member with the opposed spacing walls of the structural members being located separate and apart from one another,

said sloping wall being dimensioned relative to said spacing walls so as to provide a space between the first spacing wall of said structural member and a second spacing wall of the end of another corresponding structural member which has been fitted into said end of said structural member and so as to provide a space between the second spacing wall of said structural member and as first spacing wall of the end of another corresponding structural member which has been fitted into said end of said structural member.

4,187,654

VACUUM SYSTEM FOR SWIMMING POOLS

Spiridon Constantinescu, 161 Violet Dr., Stoney Creek, Ontario, Canada (L8E 3J2)

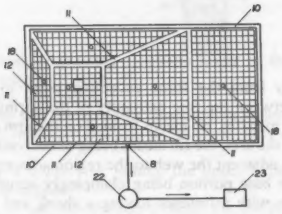
Filed Mar. 2, 1978, Ser. No. 882,943

Int. Cl.[2] E02D *27/00;* **E04H** *12/20*

U.S. Cl. 52—169.7 **2 Claims**

1. A vacuum system for swimming pools having a vinyl liner, comprising in combination: a vacuum network installed beneath the bottom and around a swimming pool connecting

each plane of the pool bottom to an upper surrounding pipe which is further connected to a separator and a vacuum pump; said vacuum network having at least one pipe for each plane of the pool bottom and each said pipe being connected to said upper surrounding pipe by a gate valve; said gate valves being able to separate the different planes of the pool bottom from said upper surrounding pipe; the surface of the pool bottom comprising plastic or rubber tiles having their upper surface impressed with geometrical designs such as squares, hexagons, circles, or any other regular geometrical figure either polygonal or curvilinear spaced enough to allow the movement of vacuum air between them and yet protect the vinyl liner against puncture; said tiles having a central thickened part which has in the middle a hole big enough to accommodate a plastic nail for fixing said tile to the ground; said thickened part being impressed like the head of said plastic nail so that when the nail is driven, the upper face of said tile mates exactly with the head of said plastic nail; said plastic nail having a series of elastic blades which secure the nail into the ground and consequently fix said tile in place; at least one said tile of each said



plane of the pool bottom being connected to said pipe of said vacuum network by means of a first drain pipe and a second drain pipe; said first drain pipe having its top channeled and perforated to allow the air to flow from between the vinyl liner and tile surface into the vacuum network, its exterior being smooth on the upper part and provided with blades on the bottom part; said second drain pipe having inside, at its upper part two or more circular channels capable of receiving ring gaskets, at its lower part two or more circular rigid ribs, and at its bottom a flange for connecting to said pipe; said upper part of said first drain pipe mating with said hole of said tile and engaging said ring gaskets; said lower part of said first drain pipe fitting with said rigid ribs; said first drain pipe and said second drain pipe being able to provide a flexible and air-tight connection between said tile and said pipe; smooth strips of Styrofoam or Foaming-rubber being placed at each corner and edge of said pool bottom to separate said planes of the pool bottom; all seams between said tiles and said smooth strips being taped with wide masking tape; and all impressions in said tiles under said masking tape being filled with synthetic resin.

4,187,655

PANEL CONSTRUCTED BUILDING

Ernest L. Anderson, 4606 148th Ave. NE., Bellevue, Wash. 98007

Division of Ser. No. 657,473, Feb. 12, 1976, Pat. No. 4,090,339, which is a continuation-in-part of Ser. No. 192,601, Oct. 26, 1971, abandoned, which is a continuation of Ser. No. 823,590, May 12, 1969, abandoned. This application Feb. 6, 1978, Ser. No. 875,422

Int. Cl.[2] E04H *1/00*

U.S. Cl. 52—236.6 **6 Claims**

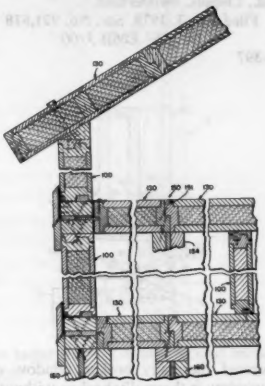
3. A building having sides, a roof and floors made from a plurality of modular panels comprising,

first floor walls made of a plurality of side-by-side abutting, interlocked, vertical, first totally closed panels, some of which contain window and door components and each having interior and exterior facing sheets and enclosing border frames surrounding all edges of said facing sheets,

second floor walls made of a plurality of side-by-side abutting said interlocked vertical first panels separate from said first floor panels,

said first panels being primary load-carrying members for carrying the load of the roof, sidewalls and floors, first and second floors made of side-by-side and end-to-end abutting interlocked separate horizontal second panels,

a roof made of said interlocked second panels,



a plurality of horizontal supports for supporting the floors and roof in spans not directly above an interior supporting wall, and

said floor panels lying completely interiorly of the interior facing sheet of said wall first panels and abutting a plane adjacent to and interiorly of the wall panels.

4,187,656

TACKING STRIP OR RAIL

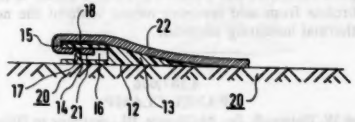
Hermann Lutz, Gartenstrasse 3, 7404 Ofterdingen, Fed. Rep. of Germany

Filed Jan. 11, 1978, Ser. No. 868,498

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1977, 2701128

Int. Cl.[2] A47G *27/04*

U.S. Cl. 52—273 **8 Claims**



1. The combination of a sheet materail having a border-edge zone and tacking rail adapted to retain the said border-edge zone of the sheet material under tension, the tacking rail comprising:

a longitudinal rail having a flat bearing surface, said longitudinal rail having a characteristic cross-sectional shape, which includes a wedge-shaped region defining one longitudinal edge of said longitudinal rail and of said flat bearing surface;

said characteristic cross-sectional shape also including two parallel wall members extending from said wedge-shaped region, said two wall members defining a tensioning groove therebetween which extends along substantially the entire length of said tacking rail;

a projection extending from at least one of said two parallel wall members into said tensioning groove;

said border-edge zone of said sheet material being positioned over the upper one of said two wall members and inserted

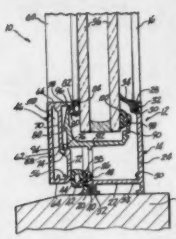
and wedged into said tensioning groove so as to completely cover the upper surface of said upper wall member.

4,187,657

THERMAL WINDOWS

Ronald D. Sukolics, Creve Coeur, Mo., assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jul. 3, 1978, Ser. No. 921,818
Int. Cl.[2] E06B *3/00*
U.S. Cl. 52—397 **45 Claims**



1. An improved thermally broken window construction wherein said window is thermally broken without the need of an insulating material comprising:

a stationary frame member defining a window opening;

at least one face member;

said face member being provided with means for securing a window pane within said frame member;

said frame member being provided with a substantially flat base portion, a first leg portion extending from said base portion toward said window pane and substantially perpendicular to said base portion and having a free end and a second leg portion extending from said base portion in the same direction as said first leg portion and having a free end;

said first leg portion and said second leg portion each being provided with nib means extending substantially parallel to said base portion which define with said base portion first and second opposing grooves; and

said stationary frame member is provided with sealing means in direct sealing engagement with one side of said window pane such that said stationary frame member is thermally broken from said securing means without the need of a thermal insulating material.

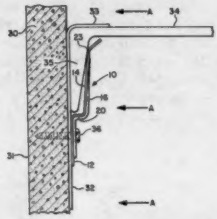
4,187,658

PANEL CLAMP

Ernest W. Reinwall, Jr., McHenry, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Continuation of Ser. No. 688,199, May 20, 1976. This application Oct. 11, 1977, Ser. No. 841,251
Int. Cl.[2] E04B *5/52*
U.S. Cl. 52—489 **6 Claims**

1. In a building assembly system for resiliently securing erect facing panels to structural members, the combination of a facing panel member, a structural beam member with an L-shaped securing extremity and a clamp device designed for resilient securement of the inner surface of the panel member to the downwardly extending leg on the structural member, the downwardly extending leg being of a tapered cross-section with its cross-sectional width being greatest at the juncture of the L, the clamp device for resiliently securing a panel member to a structural member including a base portion integrally connected to a spring arm portion by a web extending generally upwardly from the base portion, the arm and base portions extending in opposing lateral directions from the web, the arm having a free extremity forming a force accepting point and extending downwardly from the web at an acute angle toward the plane of the base thereby creating a cantilever spring biased toward the plane of the base, the force accepting point at the free extremity of the cantilever spring permitting resilient point contact between the spring arm and the surface of the leg on the structural member in a region of thickness which is greater than the distance between the plane of the base and the contact point when the spring arm is in an unloaded condition, the resilience of the spring arm in conjunction with the downward extension thereof permitting the clamping device to engage the leg portions of structural members having a predetermined range of thicknesses, a flange extending outwardly



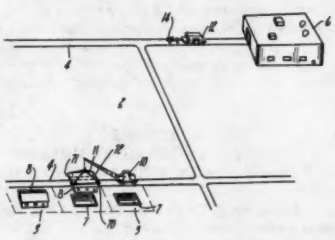
and upwardly from the force accepting point to facilitate association between the free extremity of the spring arm and the structural member, rib means formed on the arm extending lengthwise of the arm, the rib means being of decreasing height from a region adjacent the web to the region adjacent the free extremity, the base portion being clampingly secured to the panel member with a fastener having a shank and clamping head with the free extremity of the arm resiliently bearing on the structural member, wherein the arm creates a resilient clamping force on the structural member which force increases as the strain on the arm in the direction away from the plane of the base increases.

4,187,659

HOME BUILDING METHOD AND APPARATUS

Leon Blachura, Clarkston, Mich., assignor to North Oakland Development Corporation, Pontiac, Mich.

Division of Ser. No. 720,690, Sep. 7, 1976. This application Dec. 29, 1977, Ser. No. 865,469
Int. Cl.[2] E04G *21/00*
U.S. Cl. 52—745 **1 Claim**

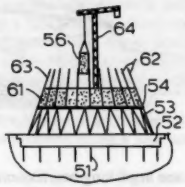


1. A method of constructing a residential development comprising, in combination, providing a suitable unitary tract of land; constructing on the tract a factory building suitable for the simultaneous, progressive fabrication of several dwelling houses, fabricating complete houses in the factory building; delivering the houses from the factory to locations on the tract and installing the houses on the foundations; and converting the factory building on its original site to use in providing services to the occupants of the residential development upon termination of fabrication of the houses and installation on the foundations.

4,187,660
METHOD OF CONSTRUCTING COOLING TOWER EMPLOYING PRECAST REINFORCED CONCRETE PANELS

Tung-Yen Lin, El Cerrito, and Yue-Chyou Yang, San Francisco, both of Calif., assignors to T. Y. Lin International, San Francisco, Calif.

Division of Ser. No. 768,175, Feb. 14, 1977, Pat. No. 4,092,811. This application Nov. 3, 1977, Ser. No. 848,294
Int. Cl.[2] E04C *3/20*
U.S. Cl. 52—747 6 Claims



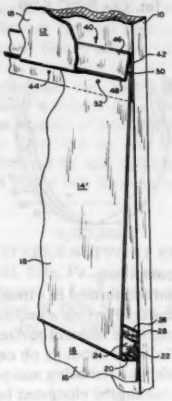
1. A method for erecting a cooling tower or the like comprising the sequential steps of:
providing a foundation,
erecting on said foundation a closed-curve series of columns inclined inwardly and also along a generally conical surface,
providing a lower ring joining the upper ends of all said columns together,
erecting on said lower ring, without the use of removable temporary holding structure, a lowermost tier, comprising a series of precast reinforced concrete panels, each having a relatively thin reinforced skin and a plurality of reinforcing ribs,
providing post-tensioning tendon means for said lowermost tier and post-tensioning said tendon means,
similarly erecting on said lowermost tier, without the use of removable temporary holding structure, a second tier comprising said panels and post-tensioning that tier,
securing said second tier to said lowermost tier,
continuing to erect said wall, tier by tier, in the same manner, securing each upper tier to its adjacent lower tier, and post-tensioning each said tier,
providing upwardly-extending post-tensioning tendons and tensioning them, and
erecting an upper ring on the upper end of said tower.

4,187,661
BUILDING SIDING REMOVAL AND REINSTALLATION SYSTEM

William R. Poiry, 5306 N. State Rt. 590, Oak Harbor, Ohio 43449

Filed Nov. 28, 1977, Ser. No. 855,428
Int. Cl.[2] E04G *23/00*
U.S. Cl. 52—748 1 Claim

1. A method of removing and reinstalling building siding comprising the steps of:
uncoupling the lower overlapped edge of a first section of siding from the upper marginal edge of a second section of siding to be removed;
removing the upper marginal edge of said second section of siding from the associated building;
uncoupling the lower overlapped edge of said second section of siding from the upper portion of a third section of siding immediately below said second section;
securing a strip to the building to couple the lower marginal edge of said first section of siding;
severing the upper marginal edge of said second section from the main portion of said second section of siding;
reinstalling said second section of siding by placing the free severed upper edge portion thereof against at least a portion of the said strip adjacent the bottom edge of said first section of siding and coupling the bottom edge thereof with the upper edge of said third section of siding; and

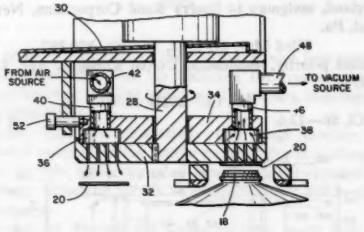


fastening the upper portion of said second section of siding to said strip.

4,187,662
APPARATUS FOR REMOVING PRESSURE SENSITIVE TAPE FROM CONTAINERS

Donald D. Cochran, Bartlett, Ill., assignor to Packaging Systems, Inc., Itasca, Ill.

Filed Oct. 2, 1978, Ser. No. 947,448
Int. Cl.[2] B65B *43/40*
U.S. Cl. 53—381 A 9 Claims



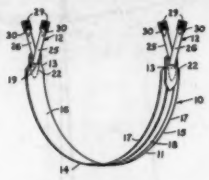
1. A device for removing tape from the tops of containers moving along a conveyor comprising:
(a) a rotor positioned above the containers provided with a plurality of vertical air passages therethrough,
(b) a stator disposed above the rotor provided with first and second plenum chambers, said chambers being spaced one from the other, said first chamber being positioned directly over the containers on said conveyor,
(c) means for rotating said rotor relative to said stator to cause the air passages to alternately communicate with said first and second plenum chambers,
(d) means for maintaining said first chamber below atmospheric pressure and said second chamber above atmospheric pressure,
whereby the partial vacuum maintained in said first chamber draws air upwardly through the rotor air passages creating a force sufficient to remove said tape from said container, and temporarily position it on said rotor, the increased pressure maintained in said second chamber subsequently effecting removal of tape positioned on the rotor.

4,187,663

SADDLE GIRTH

Gene LaCroix, Jr., 17011 N. 54th St., Scottsdale, Ariz. 85255

Filed Sep. 12, 1977, Ser. No. 832,655
Int. Cl.[2] B68C 1/00
U.S. Cl. 54—23 10 Claims



1. A saddle girth comprising:

an elongated belt portion formed of a fused solid elastomeric plastisol plastic material having a smooth inside non-moisture absorbent, abrasive resistent surface for engagement with the flesh of a horse about its rib cage and an outside surface, the plastic material being non-porous so as to not absorb moisture within the elongated belt portion during use;

wherein the belt portion is formed of a platisol plastic material comprising plasticized polyvinyl chloride having an ultimate elongation of between 300% and 450%; and

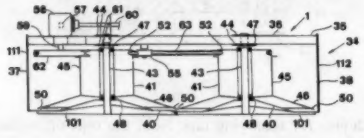
strap fastening elements at opposite ends of the belt portion adapted to be secured to a riding saddle.

4,187,664

AGRICULTURAL MACHINE STRUCTURE

Nigel W. Meek, and Jeffrey S. Ramsay, both of Aylesbury, England, assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Mar. 27, 1978, Ser. No. 890,357
Claims priority, application United Kingdom, Apr. 5, 1977, 14244/77
Int. Cl.[2] A01D 49/00
U.S. Cl. 56—13.6 8 Claims



1. A harvesting machine comprising:

a rigid, generally rectangular frame having upper and lower transverse beams and substantially vertical legs interconnecting the respective ends of said upper and lower transverse beams;

a plurality of mounting shafts detachably rotatably journalled between said upper and lower transverse beams;

a cutter unit rotatably mounted on each said mounting shaft;

upper and lower bracket means detachably connected to said upper and lower transverse beams, respectively, for rotatably journalling each said mounting shaft;

a single belt power transfer means interconnecting each said cutter unit for transferring rotational power therebetween, said single belt power transfer means being entirely below said upper transverse beam;

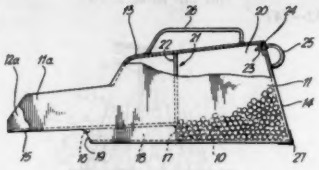
power input means connected to said power transfer means for delivering rotational power thereto.

4,187,665

DEVICE FOR USE IN PICKING BERRIES

Walter Nedila, Box 63, MacDowall, Saskatchewan, Canada (SOK 2SO)

Filed Feb. 6, 1978, Ser. No. 875,162
Claims priority, application Canada, Jun. 10, 1977, 280252
Int. Cl.[2] A01D 46/00
U.S. Cl. 56—330 1 Claim



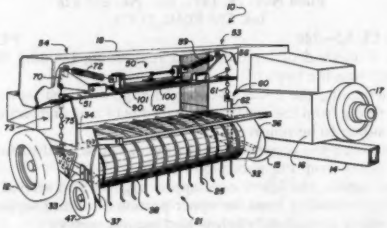
1. A device for use in picking berries comprising a container defined by a planar flat bottom wall, a top wall, a pair of opposed side walls, a hingedly mounted rear wall and an open front wall, a handle rigidly secured to said top wall, a scoop-like portion projecting forwardly from said open front wall, said scoop-like portion having side walls provided by extensions of said opposed side walls of the container, a plurality of spaced apart parallel tines disposed in a plane above the bottom wall of the container and extending rearwardly into the container to overlap a portion of said bottom wall, said tines extending forwardly between the extensions of the side walls providing a bottom wall of said scoop-like portion, said latter mentioned bottom wall being in a plane spaced upwardly from the bottom wall of the container, a screen extending across the interior of the container at a position spaced forwardly of the rear wall providing therebetween a compartment for holding berries picked from a shrub by using said tines, said screen being connected to said tines adjacent ends of the latter located in the container and defining a foraminous wall intersecting said tines, said screen having openings of sufficient size to allow berries of a selected maximum size to pass therethrough into said compartment but prevent passage therethrough of at least a major portion of leaves, branches and the like debris picked with the berries and said tines having spacings therebetween less than said selected maximum size.

4,187,666

BALER PICKUP COUNTER BALANCING MEANS

Irwin D. McIlwain, Lancaster, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Jun. 24, 1977, Ser. No. 809,889
Int. Cl.[2] A10D 39/00
U.S. Cl. 56—341 10 Claims



1. In a baler having a mobile frame adapted to move across a field, means on said frame operable to receive crop materials and form said materials into bales and a pickup assembly including pivot means on said frame and pickup means disposed

generally forwardly of said pivot means and operable to pick up crop materials from the field and feed said materials to said receiving and forming means, said pickup means being connected to said pivot means for vertical swinging movement about a generally horizontal axis defined by said pivot means, a counterbalance means for said pickup including a pair of aligned pivot cranks fixed to said frame generally above said pickup means, one of said pair of pivot cranks positioned above each lateral end of said pickup means and fixed thereto for swinging movement in a plane parallel to the longitudinal axis of the pickup means, each said pivot crank including a resilient biasing means having a first end connected to the pivot crank and a second end affixed to said frame such that said pivot cranks are urged in a direction to counterbalance said pickup means, an improved mechanism for adjusting the counterbalance forces comprising:

an elongate keeper means affixed to said frame with its longitudinal axis directed along a line between said pivot cranks;

a variable length coupling means fixed to each of said resilient biasing means at the second ends thereof whereby variation of the length of said coupling means correspondingly changes the distance between said second ends; and

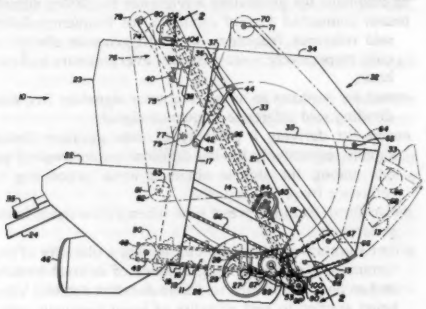
said coupling means is slidingly engaged with said keeper means.

4,187,667

COLLECTION AND RECYCLING APPARATUS FOR CROP PARTICLES IN A ROLL FORMING MACHINE

Aquila D. Mast, Lancaster, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Jan. 3, 1978, Ser. No. 866,330
Int. Cl.[2] A01D *39/00*
U.S. Cl. 56—341 **7 Claims**



1. A roll forming machine for crop material comprising:

(a) a mobile frame adapted to move across an open field, said frame having a front end, two opposing sides, and a rear end;

(b) conveying means fixed to said frame, said conveying means having a front end, two opposing sides and a rear end thereby defining a transport plane along which crop material is moved from said front end towards said rear end, said front end, opposing sides and rear end of said conveying means further being in substantially the same orientation as said front end, opposing sides and rear end of said frame;

(c) pickup means mounted to said frame adjacent said front end of said conveying means for engaging crop material and depositing it on said transport plane of said conveying means;

(d) bale forming means mounted to said frame substantially above said conveying means defining therebetween a bale forming region, said bale forming means including a movable motion-imparting curvilinear surface extending at least from a first location substantially in the same plane as said transport plane to a second location above said transport plane;

(e) drive means operably connected to said bale forming means to impart motion thereto such that crop material delivered to the bale forming region by said conveying means is rotated to form a substantially cylindrical bale;

(f) collection means supported on said frame adjacent said conveying means' rear end, said collection means positioned below said transport plane and at least partially below said first location of said bale forming means; and

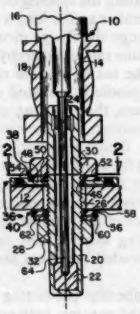
(g) return means supported on said frame whereby crop material accumulated by said collection means is moved therefrom back to the bale forming region.

4,187,668

ADJUSTABLE SUPPORT SYSTEM

Edward J. Olowinski, Erie, Pa., and Leonard W. Foster, Richardson, Tex., assignors to Lord Corporation, Erie, Pa.

Filed Dec. 8, 1978, Ser. No. 967,746
Int. Cl.[2] D01H *7/12*
U.S. Cl. 57—130 **20 Claims**



1. An adjustable support system for mounting a first member on a second member and for reducing the transmission of vibrations between the first and second members, said support system comprising:

(a) means defining a substantially rigid flange member;

(b) means secured to the flange member for mounting the first member resiliently relative to the flange member, the resilient mounting means including at least one body of elastomer;

(c) means for spacing the flange member apart from the second member, the spacing means including a portion for at least contacting the flange member and a portion for at least contacting the second member;

(d) means for adjusting the spacing between at least a portion of the flange member and at least a portion of the second member so as to change the flange member's orientation relative to the second member, the adjusting means including a portion for at least contacting the flange member and a portion for at least contacting the second member, the adjusting means being disposed to contact the flange member in spaced relation relative to the resilient mounting means so as to avoid compressing the elastomer in the mounting means between the adjusting means and the flange member; and

(e) means for resiliently permitting and accommodating adjustments in the spacing between the flange member and the second member, the adjustment accommodating means including at least one body of elastomer and having a portion for at least contacting the second member and a portion for at least contacting a member that moves in response to adjustments of the adjusting means.

20. An adjustable, vibration isolating support system for mounting a textile spindle on a machine rail or the like, the

machine rail having formed in it an opening to receive the textile spindle, the spindle carrying two annular flanges that extend radially from the spindle and are spaced apart along the length of the spindle, at least one of said two spindle flanges being movable along the length of the spindle to clamp the spindle to a supporting structure disposed between the spindle flanges, the support system comprising:

(a) means defining a flange member fabricated of substantially inextensible material, the flange member having formed in it a central opening for receiving the textile spindle and at least two peripheral openings that are spaced from the central opening and from each other in a circumferential array about the central opening;

(b) means secured to the flange member about the central opening for mounting the textile spindle resiliently relative to the flange member, the resilient mounting means including at least one body of elastomer that has formed in it a central opening aligned with the central opening in the flange member;

(c) means for spacing the flange member apart from the machine rail, the spacing means including a portion for at least contacting the flange member and a portion for at least contacting the machine rail;

(d) means for adjusting the spacing between at least a portion of the flange member and at least a portion of the machine rail so as to change the flange member's orientation relative to the machine rail and thereby to change the vertical orientation of the textile spindle relative to the machine rail when said spindle is mounted on the machine rail by the support system, the adjusting means including at least two threaded members that are received in the peripheral openings of the flange member, each threaded member having a surface for at least contacting the flange member and a surface for at least contacting the machine rail, the threaded members also being spaced from said at least one body of elastomer of the resilient mounting means so as to avoid compressing said at least one body of elastomer between the threaded members and the flange member; and

(e) means for resiliently permitting and accommodating adjustments in the spacing between the flange member and the machine rail, the adjustment accommodating means including at least one body of elastomer that has formed in it a central opening, the adjustment accommodating means having one surface for contacting the machine rail and a second surface opposite the first surface for contacting a member that moves in response to adjustments of the adjusting means.

4,187,669

KNITTING MATERIAL

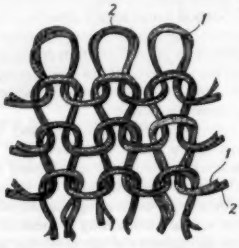
Rikio Hamanaka, Kyoto, Japan, assignor to Hamanaka Kabushiki Kaisha, Kyoto, Japan

Filed Jan. 26, 1978, Ser. No. 872,660

Claims priority, application Japan, Feb. 1, 1977, 52-10439; Aug. 9, 1977, 52-106877[U]

Int. Cl.[2] D02G *3/06, 3/44*

U.S. Cl. 57—235 **8 Claims**



1. Knitting material which comprises a fine tape comprised of a non-woven fabric prepared by the spun-bond process, said tape having been prepared by slitting said non-woven fabric lengthwise, said tape having a weight per area of not more than 30 g/m^2 and having a width of 5 to 20 mm, said tape having been twisted so as to have, on the average, from 2 to 20 turns per one meter lengthwise.

4,187,670

TIME SIGNAL GENERATOR CIRCUIT FOR USE IN AN ELECTRONIC TIMEPIECE

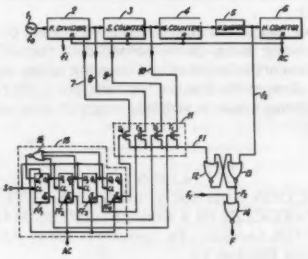
Yasunobu Okano, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 2, 1978, Ser. No. 882,767

Claims priority, application Japan, Mar. 4, 1977, 52-23598

Int. Cl.[2] G04C *3/00, 21/12, 21/16;* G08B *3/00*

U.S. Cl. 58—23 R **8 Claims**



1. A time signal generator circuit comprising:

an oscillator for generating a reference frequency signal;

means connected to said oscillator for frequency-dividing said reference frequency signal to generate electric signals, respectively, every second, every minute and every hour;

means for deriving an audio frequency signal by frequency-dividing said reference frequency signal;

means for deriving a plurality of time duration decision signals respectively having different predetermined periods among the signals obtained upon processing said reference frequency signals;

means for detecting a preset time when a time signal is to be generated;

a time duration switching circuit having a plurality of input terminals, a corresponding number of control terminals and an output terminal, said time duration decision signals being applied to said plurality of input terminals, one of said control terminals receiving a control signal for delivering at said output terminal said time duration decision signal applied to said input terminal associated with said one control terminal;

a ring counter consisting of a plurality of flip-flops cascaded with each other, said control signal being derived from one of the output terminals of said flip-flops, the output terminals of said flip-flops in said ring counter being connected, respectively, to said control terminals of said time duration switching circuit to thereby apply said control signals to said control terminals; and

means for transmitting said audio frequency signal to an audible signal converter in response to the output of said means for detecting a preset time, during a time duration equal to the period of said time duration decision signal;

wherein said frequency-dividing means comprises a frequency-divider transforming said reference frequency signal into 1 H_z signal, a second counter counting said 1 H_z signal and deriving 1/60 H_z signal, a minute counter counting said 1/60 H_z signal and deriving 1/3600 H_z signal, and an hour counter counting said 1/3600 H_z signal; and

wherein said means for transmitting said audio frequency

signal to an audible signal converter comprises an R-S flip-flop having a set terminal connected to the output of said preset time detecting means and a reset terminal to which is operatively applied the output obtained at said output terminal of said time duration switching circuit, and means for applying said audio frequency signal to the audible signal converter during the time when said R-S flip-flop produces an output.

4,187,671

ELECTRONIC WATCH WITH REACTION TIMER

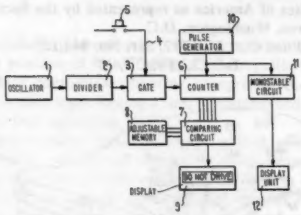
Jean-Claude Fatton, Le Landeron, Switzerland, assignor to Ebauches Electroniques S.A., Marin, Switzerland

Filed Nov. 14, 1977, Ser. No. 851,176

Claims priority, application Switzerland, Nov. 22, 1976, 14639/76

Int. Cl.² G04B *47/06*

U.S. Cl. 58—152 B **6 Claims**



1. An electronic watch capable of measuring the time in which a user of the watch reacts to a stimulus the occurrence of which is unknown to and independent of control of the user, comprising:

oscillator means for generating clock signals;

first display means providing the stimulus to signal the start of a reaction time test sequence;

generator means coupled to said first display means for automatically activating said first display means independent of external control;

counter means for counting said clock signals, said counter means being reset by said generator means simultaneous to actuation of said first display means;

control means operatively coupled to said counter means for stopping the count thereof, said control means being manually operable by the user of the watch in response to the actuation of said first display means such that the count of said counter means is a measure of the reaction time of the user;

means for memorizing a time reference;

comparator means for comparing the reaction time represented by the count of said counter means with said memorized time of reference; and

second display means controlled by the output of said comparator for delivering a warning whenever the reaction time exceeds said time of reference.

4,187,672

APPARATUS FOR CONVERTING CARBONACEOUS MATERIAL INTO FUEL GASES AND THE RECOVERY OF ENERGY THEREFROM

Ned S. Rasor, Sunnyvale, Calif., assignor to Rasor Associates, Inc., Sunnyvale, Calif.

Filed Nov. 17, 1977, Ser. No. 852,525

Int. Cl.² F02B *43/08*; C10J *3/20*

U.S. Cl. 60—39.12 **29 Claims**

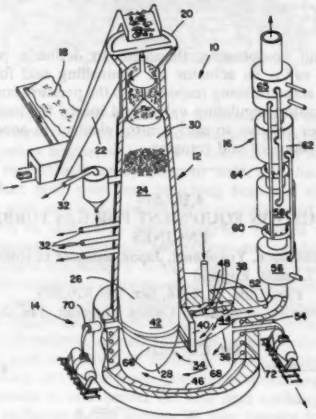
1. Apparatus for converting a feed which includes a sulfur component and which yields carbon on being heated above a carbonization temperature thereof and which is solid at ambient temperature into a hot gas, comprising:

a reactor;

a liquid solvent for carbon which fills said reactor up to a liquid level therein below a top thereof;

partition means, separating said reactor above said liquid level into a carbonization chamber and oxidation chamber means, said partition means terminating below said liquid level and above a bottom of said reactor to allow flow of liquid between said carbonization chamber and said oxidation chamber means, said partition means further defining a leaching chamber within said reactor separated above said liquid level from said carbonization chamber and said oxidation chamber means but allowing flow of liquid thereinto and thereoutof;

means for introducing a feed which yields carbon on being heated above a carbonization temperature thereof and which is solid at ambient temperature into said carbonization chamber;



means for introducing oxidizing means having an oxygen content into said oxidation chamber means to produce oxygen bound in said liquid solvent;

means for causing flow of said liquid between said carbonization chamber and said oxidation chamber means;

means for introducing a metal oxide, said metal forming a sulfide which is insoluble in said liquid and of a different density therefrom whereby said metal sulfide when formed separates into a sulfide layer, into said leaching chamber;

means for conducting off gas formed by reaction of said metal oxide with sulfur and carbon dissolved in said liquid in said leaching chamber away therefrom;

means for removing said sulfide layer from said leaching chamber; and

means for conducting away from said oxidation chamber means a first hot gas formed therein.

4,187,673

FUEL CONTROL SYSTEM FOR A GAS TURBINE ENGINE

Trevor S. Smith, Sutton Coldfield, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Oct. 11, 1977, Ser. No. 840,569

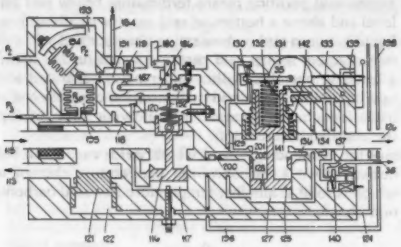
Claims priority, application United Kingdom, Oct. 13, 1976, 42485/76; Jan. 7, 1977, 655/77

Int. Cl.² F02C *9/04*

U.S. Cl. 60—39.28 R **18 Claims**

1. A fuel control system for a gas turbine engine, comprising a fuel metering valve which is responsive to a first servo pressure signal, a first pilot valve for regulating said first servo pressure signal, a control element which is movable in response

to a second servo pressure signal, a second pilot valve for controlling said second servo pressure signal, means responsive to engine speed, for positioning said second pilot valve, selector means movable in response to changes in a desired speed of the engine, a member slidable relative to said control



element and co-operating therewith to define a pressure-regulating valve, an actuator for controlling said first pilot valve, said actuator being responsive to the pressure controlled by said pressure regulating valve, and means for positioning said member relative to said control element in accordance with the position of said actuator.

4,187,674

COMBUSTION EQUIPMENT FOR GAS TURBINE ENGINES

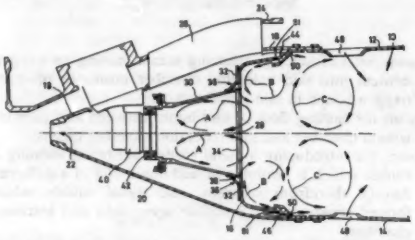
John P. Richardson, Yokohama, Japan, assignor to Rolls-Royce Limited, London, England

Filed Jan. 18, 1978, Ser. No. 870,593

Claims priority, application United Kingdom, Jan. 21, 1977, 2467/77

Int. Cl.² F02C 7/22

U.S. Cl. 60—39.36 **4 Claims**



1. Combustion equipment for a gas turbine engine to be located in a stream of compressed air, comprising:

an annular flame tube having an upstream end wall provided with a circumferential array of equi-spaced generally circular apertures for the admission of liquid fuel and air into said tube, the diameter of each of said apertures being less than the radial dimension of said end wall;

a plurality of upstream-projecting vortex-generating pots, one for each of said apertures arranged adjacent the upstream side thereof and aligned therewith, each of said pots comprising a downstream-diverging generally conical duct;

liquid fuel injection means adjacent the upstream end of each of said pots which, in operation, tends to form a film of fuel on the inner surface of the corresponding one of said ducts; and

duct means adjacent the downstream end of each of said pots comprising a substantially circumferential gap between the downstream end of the corresponding one of said pots and said upstream side of the corresponding one of said apertures for directing a supply of the compressed air substantially radially inwardly across said downstream end of the corresponding one of said ducts for detaching therefrom the film of fuel on the inner surface thereof so that the film will be entrained in vortices formed within the upstream end of said flame tube and will not burn on the walls of said tube.

4,187,675

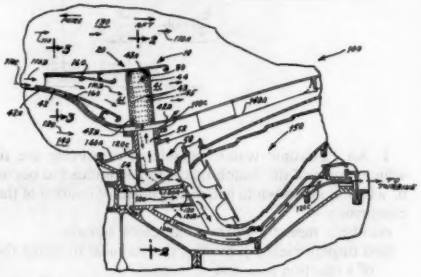
COMPACT AIR-TO-AIR HEAT EXCHANGER FOR JET ENGINE APPLICATION

Thomas G. Wakeman, West Chester, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 14, 1977, Ser. No. 842,139

Int. Cl.² F02C 7/18

U.S. Cl. 60—39.75 **5 Claims**



1. A compact air-to-air heat exchanger, adapted for use in a gas turbine engine of the fan bypass type having a hot flow of cooling air, a cool flow of fan air, and a primary fan air stream duct in which a first portion of said cool flow of fan air flows, comprising:

a. means for cooling said hot flow of cooling air;

b. and, means for heating a second portion of said cool flow of fan air, with this said means in association with said cooling air cooling means;

wherein said compact air-to-air heat exchanger is disposed internal of said bypass type gas turbine engine, whereby heat is transferred from said hot flow of cooling air to said second portion of said cool flow of fan air, thereby resulting in an exhaust flow of cooled cooling air; and

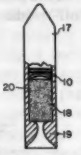
wherein said means for cooling and said means for heating include, in common, a secondary fan air stream duct, adjacent to said primary air stream duct, through which flows said second portion of said cool flow of fan air, and, a plurality of flow tubes through which flows said hot cooling air, with said flow tubes disposed within and in transverse relationship to said secondary fan air stream duct, and are also simultaneously disposed in cross flow relationship with and to said second portion of said cool flow of fan air, and with said flow tubes having a plurality of circumferentially spaced, radially extending headers which are supported from and are connected to a common cooling air inlet manifold disposed radially inward therefrom and a plurality of circumferentially spaced, radially extending headers which are supported from and are connected to a common cooling air outlet manifold disposed radially inward therefrom.

4,187,676

BI-METALLIC THERMAL COMPENSATOR FOR MOUNTING A SOLID PROPELLANT GRAIN

Scott M. O'Neil, Ridgecrest, Calif., and Howard H. Payne, Las Vegas, Nev., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 13, 1978, Ser. No. 885,706
Int. Cl.[2] F02K 9/04
U.S. Cl. 60—255 4 Claims



1. A thermally responsive bi-metallic compensator for stabilizing the position of free-floating solid propellant grain in a rocket motor combustion chamber, comprising:

a first metallic layer having a first predetermined coefficient of thermal expansion; and

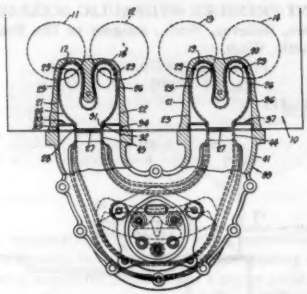
a second metallic layer having a second predetermined coefficient of thermal expansion, said second metallic layer joined to said first metallic layer to form a thermally responsive bi-metallic structure, said thermally responsive bi-metallic structure mounted in the front end of said rocket motor combustion chamber.

4,187,677

EXHAUST PORT LINER SUPPORT FOR INTERNAL COMBUSTION ENGINE

Yoshitoshi Sakurai, Niiza, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 677,665, Apr. 16, 1976, abandoned.
This application Apr. 7, 1978, Ser. No. 894,588
Int. Cl.[2] F01N 3/10
U.S. Cl. 60—282 2 Claims



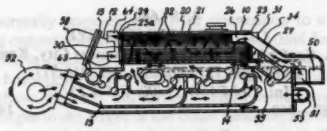
1. In an internal combustion engine having an exhaust valve operatively interposed between walls forming a combustion chamber and wall forming an exhaust port passage, the improvement comprising, in combination: an exhaust port liner insertable into position within the exhaust port passage, in the absence of said valve, said liner being bifurcated to form two entrance portions, the major portion of the length of said liner being spaced with respect to the wall forming said exhaust port passage, said liner having a circular projection defining a discharge opening for said liner, and a support piece having a peripheral skirt tightly fitting into said wall of the exhaust port passage, said support piece being fixed on said liner projection, said support piece acting to prevent flow of exhaust gases between said liner and the wall of the exhaust port passage.

4,187,678

MARINE ENGINE MANIFOLD

Frederik J. Herenius, Peterborough, England, assignor to Perkins Engines Limited, London, England

Filed Mar. 31, 1977, Ser. No. 783,353
Claims priority, application United Kingdom, Apr. 8, 1976, 14220/76
Int. Cl.[2] F01N 3/02
U.S. Cl. 60—321 4 Claims



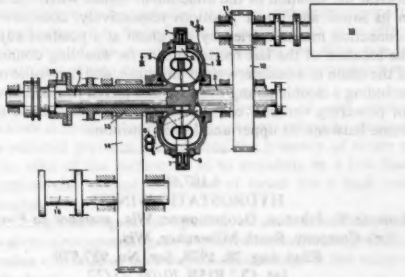
1. A manifold comprising a body formed from a single casting and connectible to exhaust and induction parts of an internal combustion engine, an induction manifold and an exhaust manifold respectively comprising an induction duct and an exhaust duct both with port matching branches all formed integrally with said body, means for connecting said branches respectively to said parts, walls integrally formed with said body enclosing said induction and exhaust ducts and defining a coolant jacket including a lower portion surrounding said ducts while forming coolant passages between the exhaust and induction ducts, means for connecting said coolant jacket to a source of liquid coolant including a coolant outlet of said engine, walls defining a header for said coolant jacket formed integrally with said body to create an upper portion of said coolant jacket above the lower portion, heat exchange means, support means in said header for said heat exchange means, said heat exchange means forming an inlet passage for coolant flowing from said source and said casting further including an integrally formed by-pass duct parallel to and adjacent said header and extending substantially the length of said heat exchanger means for connecting said coolant jacket directly to the said source of liquid coolant.

4,187,679

DEVICE FOR INVERTING THE DIRECTION OF ROTATION OF A DRIVEN SHAFT

Enrico Fortunato, Milan, Italy, assignor to Franco Tosi S.p.A., Milan, Italy

Filed Feb. 27, 1978, Ser. No. 881,715
Int. Cl.[2] F16D 33/04
U.S. Cl. 60—331 5 Claims



1. A hydraulic coupling device for transferring rotational drive from a driving shaft to a driven shaft, the device compris-

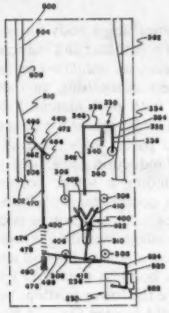
ing a driving cup and a driven cup, vane means associated with the respective cups to establish fluid flow between the cups and rotation of the driven cup responsive to rotation of the driving cup, casing means defining an annular chamber between said cups in fluid flow communication with the vane means of the respective cups, a set of flow-diverting vanes associated with said casing means, said vanes having first positions relative to said channel establishing a first direction of rotation of the driven cup relative to the driving cup and second positions relative to said channel establishing a reverse direction of rotation of the driven cup relative to the driving cup and separate actuators for each of said vanes for moving the vanes between said first and second positions.

4,187,680

OIL WELL PUMP DRIVE

George A. Sanford, 300 E. Kansas, Arkansas City, Kans. 67005

Filed Jun. 12, 1978, Ser. No. 914,577
Int. Cl.[2] F16D *31/00*; F15B *15/22*
U.S. Cl. 60—369 14 Claims



1. An oil well pumping system comprising a frame adapted to be fixedly mounted at a wellhead, a unit mounted on the frame for vertical reciprocation between upper and lower positions, said unit having vertically spaced upper and lower sprockets mounted thereon for rotation about parallel horizontal axes, an endless chain extending between and entrained over said sprockets to define front and rear chain flights, said chain being fixedly secured to the frame against vertical movement at a position along the rear flight of the chain in an arrangement such that the upper and lower sprockets are nearest the position of chain securance when the unit is in its lower and upper positions respectively, polish rod attachment means carried by the chain for enabling attachment of the latter to a well pump polish rod, said attachment means being carried by the chain at a location along the front flight thereof in an arrangement such that the lower and upper sprockets are nearest the location of the attachment means when the unit is in its lower and upper positions respectively, counterweight connection means carried by the chain at a position adjacent the location of the last recited means for enabling connection of the chain to a counterweight structure, and hydraulic means including a double-acting cylinder and piston rod combination for powering vertical reciprocation of the unit relative to the frame between its upper and lower positions.

4,187,681

HYDROSTATIC WINCH

Kenneth V. Johnson, Oconomowoc, Wis., assignor to Bucyrus-Erie Company, South Milwaukee, Wis.

Filed Aug. 28, 1978, Ser. No. 937,578
Int. Cl.[2] F15B *20/00, 15/22*
U.S. Cl. 60—395 10 Claims

1. A hydrostatic winch including a hydraulic control system with a dual valve for adjusting pressure in control lines to drive a winch to hoist or lower a load and a brake for stopping the movement of the winch and the load which is characterized by:

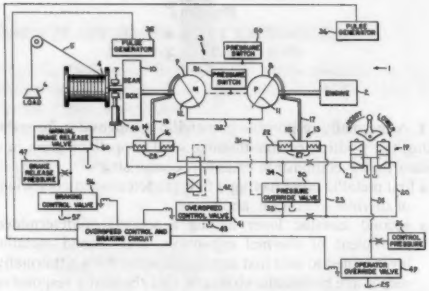
(A) an overspeed control system including:

(1) a valve for bleeding pressure from a control line to slow the winch; and

(2) valve control means which detects overspeed and activates the valve to slow the winch; and

(B) a fail safe system for smoothly stopping the winch and load, if necessary, including:

(1) a normally "off" brake biased towards an "on" position and held in the "off" position by pressure in a hydraulic cylinder;



(2) a valve for bleeding pressure from the hydraulic cylinder;

(3) first means for detecting when the speed of the load or winch is exceeding a predetermined limit;

(4) second means for detecting when an abnormal condition exists which could cause overspeed; and

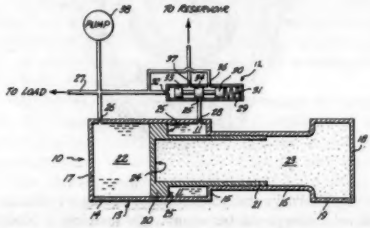
(5) control means for the valve for bleeding pressure from the hydraulic cylinder, which control means is activated by receipt of a signal from either first or second means to bleed pressure from said cylinder to apply the brake to smoothly stop the load.

4,187,682

CONSTANT PRESSURE HYDRAULIC ACCUMULATOR

Jan-son Shen, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 2, 1979, Ser. No. 66
Int. Cl.[2] F15B *1/02, 1/04*
U.S. Cl. 60—413 7 Claims



1. In a variable load demand hydraulic system having a pressure side and a return side and a pump operable to deliver only a portion of the intermittent peak load demanded of said system, a constant pressure hydraulic fluid accumulator assembly for augmenting the fluid flow output of said pump during intermittent periods of peak load demand comprising:

a hydraulic fluid accumulator having an accumulator fluid reservoir and including elements relatively movable to

vary the volume of said reservoir, means maintaining said fluid reservoir in fluid communication with the pressure side of said hydraulic system;

gas compressor means having a gas reservoir containing a predetermined charge of gas, said gas compressor means including elements relatively movable to vary the volume of said gas reservoir, means operably connecting a movable element of said gas compressor means to a movable element of said fluid accumulator whereby the pressure of said gas in said gas reservoir causes pressure to be applied to fluid in said accumulator fluid reservoir;

auxiliary fluid drive means having an auxiliary fluid drive reservoir and including elements relatively movable to vary the volume of said auxiliary fluid drive reservoir, means operably connecting a movable element of said auxiliary fluid drive means to a movable element of said hydraulic accumulator whereby pressure exerted by fluid in said auxiliary drive reservoir causes pressure to be applied to fluid in said accumulator fluid reservoir; and,

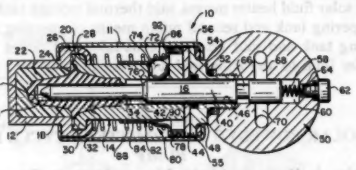
pressure regulator valve means responsive to system pressure and operable to connect said auxiliary fluid drive reservoir in fluid communication with the pressure side of said hydraulic system in response to system pressure less than a predetermined system fluid pressure and to connect said auxiliary fluid drive reservoir in fluid communication with the return side of said hydraulic system in response to system pressure above said predetermined system fluid pressure.

4,187,683

THERMAL POWER ELEMENT WITH SAFETY LOCKUP

Richard A. Northrop, Jr., Cheshire, and David J. Wanat, Meriden, both of Conn., assignors to Century Brass Products, Inc., Waterbury, Conn.

Filed Jun. 12, 1978, Ser. No. 914,522
Int. Cl.² F03G 7/06; G05D 23/12
U.S. Cl. 60—527 **14 Claims**



1. In a temperature responsive force transmitting device including a housing having a closed end containing a temperature sensitive expansible material and a piston guide having an interior guide chamber, a resilient boot within the housing adjacent the expansible material and having a neck extending within the piston guide, and a piston received within the boot and the guide chamber, the piston being axially movable between an inoperative position and an extended operating position respectively upon contraction and expansion of the temperature sensitive expansible material, a safety lockup comprising locking means within the housing movable into a locking position in cooperation with the piston in its operating position, and restraining means selectively operable for securing the locking means in locking position at a preselected temperature to lockup the piston in its operating position.

4,187,684

THERMALLY RESPONSIVE POWER ELEMENTS WITH MULTIPLE VAPOR/GAS FILLED CAPSULES AND HYDRAULIC FLUID TRANSMISSIONS

Charles R. Smith, West Allis, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 17, 1976, Ser. No. 697,211
Int. Cl.² F03G 7/06
U.S. Cl. 60—531 **3 Claims**

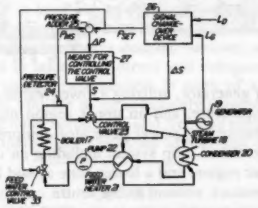
1. A thermally responsive unit for connection to a motion producing output unit in a closed system using fluid for power transmission in response to temperature changes, in combination, two housing members at least one of which is of shallow channel shape and has out-turned flanges which are sealed along its edges to the edges of the other member, a multiplicity of circular convoluted discs hermetically sealed to the inner surfaces of said housing members with air being evacuated from the spaces between each of said discs and the member to which they are sealed and individual partial fills of a thermally sensitive vapor/gas being provided in place thereof in said spaces.

4,187,685

METHOD AND SYSTEM FOR EFFECTING CONTROL GOVERNING OF A STEAM TURBINE

Kunio Tsuji; Katsukuni Hisano; Akira Sakai, all of Hitachi, and Shozo Nakamura, Hitachiohta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 10, 1978, Ser. No. 876,944
Claims priority, application Japan, Feb. 18, 1977, 52-16897
Int. Cl.² F01K 13/02
U.S. Cl. 60—660 **6 Claims**



1. A method for effecting control governing of a steam turbine having a first stage nozzle including a steam chamber divided into a plurality of steam compartments, and a plurality of control valves each connected to one of said steam compartments and adapted to be individually operated to as to effect the governing of the nozzle by controlling the flow rate of steam introduced into the turbine, such method comprising the steps of:

keeping constant the degree of opening of said control valves at low load operating the steam turbine by steam of a reduced pressure by reducing the pressure of steam at the inlet of the turbine so as to maintain, in a low load region, the volume flow rate of steam for a high load region;

presetting the degree of opening of each of said control valves corresponding to a predetermined change in the value of a load so as to cope with a change in the value of the load;

altering the degree of opening of the control valve involved

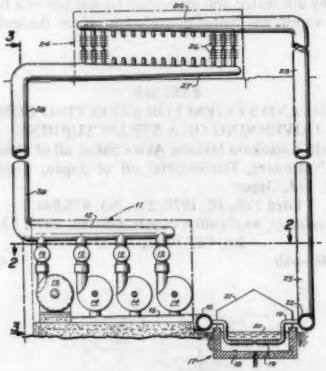
when the change in the value of the load is smaller than the predetermined change in the value of the load; and controlling the pressure of steam at the inlet of the turbine when the change in the value of the load is greater than the predetermined change in the value of the load.

4,187,686

POWER GENERATOR UTILIZING ELEVATION-TEMPERATURE DIFFERENTIAL

Lorenzo A. Pommier, 3795 Roberta St., Los Angeles, Calif. 90031

Filed Jan. 16, 1978, Ser. No. 869,646
Int. Cl.[2] F03G 7/04
U.S. Cl. 60—647 **11 Claims**



1. A power generator, utilizing a lower region maintained at an upper temperature, and an upper region maintained at a lower temperature, the power generator comprising:

a. a tubular closed loop system including an upper zone at said upper region, and a lower zone at said lower region, and a penstock column and a return column connecting the zones to complete the loop system;

b. a fluid under pressure sealed in the loop system, the fluid being at a preselected upper pressure and temperature at the lower zone and at a preselected lower pressure and temperature at the upper zone, the fluid having a critical gas-liquid conversion pressure temperature between the pressure-temperature at the lower zone and the pressure-temperature at the upper zone;

c. a condensing heat exchanger at the upper zone for converting said fluid from a gaseous state to a liquid state for movement of the fluid in a liquid state into the penstock column to create a liquid head causing downward movement of the liquid therein;

d. an evaporating heat exchanger at the lower zone for converting said fluid from a liquid state to a gaseous state for movement of the fluid in a gaseous state up the return column, whereby continuous circulation of fluid is maintained in the loop system;

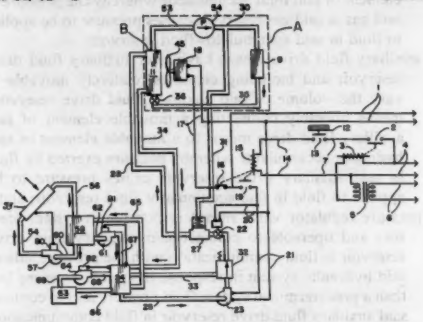
e. and at least one hydraulic motor is positioned for engagement by the liquid phase moving in the penstock column.

4,187,687

SYSTEM FOR UTILIZING SOLAR ENERGY AND AMBIENT AIR IN AIR CONDITIONERS DURING THE HEATING MODE

Harry A. Savage, Bellwood, Rt. #2, Box 41, Greenwood, Ark. 72936

Filed Jan. 16, 1978, Ser. No. 869,799
Int. Cl.[2] F25B 27/00
U.S. Cl. 62—2 **3 Claims**



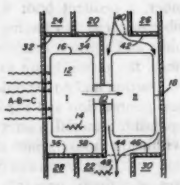
1. A system for utilizing solar energy and ambient air in air conditioners during the heating mode comprising the combination of an evaporator assembly for selective heat exchange with heated fluid and ambient air and a solar heat collector system, said evaporator assembly having a plurality of fluid pipes, header means connecting said fluid pipes, said header means having an inlet and an outlet, pump means connected to said inlet, a plurality of refrigerant pipes connected in series and telescopically mounted over said fluid pipes, said refrigerant pipes having an inlet and an outlet, a plurality of fins mounted on said refrigerant pipes, fans means mounted in proximity of said fins for directing ambient air in the direction of said fins, control means operatively connected to said pump means and said fan means for operating said pump means and rendering said fan means inoperative when the ambient air is less than a predetermined temperature and vice versa when the ambient air is above said temperature and said solar heat collector system having solar fluid heater means, a thermal storage tank and a tempering tank, first pump means connecting said solar fluid heater means, said thermal storage tank and said tempering tank and second pump means connecting said tempering tank and said header means inlet and outlet directing heater fluid to and from said heat exchanger.

4,187,688

SOLAR POWERED INTERMITTENT CYCLE HEAT PUMP

Charles A. Berg, Buckfield, Me., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Oct. 10, 1978, Ser. No. 950,069
Int. Cl.[2] F25B 27/00, 17/02
U.S. Cl. 62—2 **42 Claims**



1. A process for heating a thermal sink using solar radiation

as the primary energy source, said process comprising the steps of:

A. providing a solar collector,

B. providing a pressure tight enclosure defining first and second chambers separated by a valve, said enclosure containing a working refrigerant, said first chamber being in thermal communication with said collector and containing an adsorbent material capable of adsorbing said refrigerant exothermically;

C. raising the vapor pressure in said first chamber and desorbing the refrigerant from the adsorbent material using solar energy;

D. allowing the desorbed refrigerant vapor to migrate through the valve to said second chamber and condensing the vapor therein by transferring the refrigerant's heat of condensation into the thermal sink;

E. closing the valve to isolate the chambers;

F. transferring heat from the adsorbent material to the thermal sink to lower the vapor pressure in said first chamber;

G. opening the valve for a sufficient amount of time to cool the condensed refrigerant in said second chamber by flash evaporation to a temperature below the temperature of the atmosphere;

H. readsorbing refrigerant vapor produced during flash evaporation in step G into said adsorbent material and transferring the resulting heat of adsorption from said first chamber to the thermal sink;

I. vaporizing the cooled refrigerant in said second chamber by extracting heat from the atmosphere to provide the refrigerant's heat of vaporization;

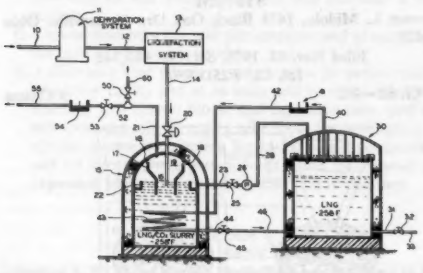
J. allowing the refrigerant vapor produced in step I to migrate through the valve to said first chamber to readsorb in said adsorbent material and transferring the resulting heat of adsorption from said first chamber to the thermal sink via a heat transporting fluid.

4,187,689

APPARATUS FOR RELIQUEFYING BOIL-OFF NATURAL GAS FROM A STORAGE TANK

Yuksel A. Selcukoglu, Naperville; Matloob Husain, Wheaton, and Carl C. Hanke, Jr., Oak Brook, all of Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Sep. 13, 1978, Ser. No. 941,785
Int. Cl.[2] F17C *7/02*
U.S. Cl. 62—54 **5 Claims**



1. In a combination of apparatus for storing liquefied natural gas which includes an insulated separation tank in which solidified carbon dioxide is settled out of liquefied natural gas and a liquefied natural gas-solidified carbon dioxide slurry accumulates, an insulated liquefied natural gas storage tank, and a conduit for delivering liquefied natural gas from the separation tank to the storage tank, the improvement comprising:

means for withdrawing natural gas boil-off from the storage tank and compressing it,

conduit means for feeding the compressed natural gas boil-off into indirect heat exchange with a liquefied natural gas-solidified carbon dioxide slurry in the separation tank to cool the compressed natural gas to reliquefied natural gas, and

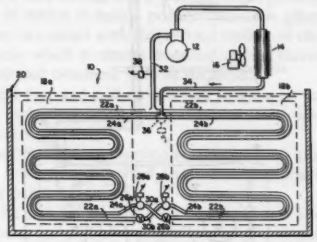
means to feed the reliquefied natural gas from the separation tank to the storage tank.

4,187,690

ICE-MAKER HEAT PUMP

Herbert S. Lindahl, Danville, Ill., assignor to Gulf & Western Manufacturing Company, New York, N.Y.

Filed Aug. 16, 1978, Ser. No. 934,079
Int. Cl.[2] F25C *1/08*
U.S. Cl. 62—138 **36 Claims**



1. An improved evaporator for an ice-making heat pump of the type which includes a compressor for circulating a supply of refrigerant, a condenser, and an evaporator, said evaporator adapted to be arranged in heat exchange relationship with water to be in contact therewith and comprising a plurality of freezing plates, each of said freezing plates having a first passageway therein arranged to conduct relatively cold evaporating refrigerant therethrough in heat exchange relationship with water to be in contact with the outer surfaces of said freezing plates to form ice on the outer surface of at least one of said freezing plates, and a second passageway therein arranged to conduct relatively warm refrigerant therethrough in heat exchange relationship with the ice to be formed on the outer surface of at least one of said freezing plates to release said ice, each of said passageways having inlet and outlet ends, respectively, and valve means coupled between said freezing plates arranged to selectively direct said refrigerant between said first and second passageways in each of said freezing plates to enable said ice to be selectively formed on and released from the outer surfaces of said freezing plates when said evaporator is operatively connected to said heat pump.

4,187,691

HEAT PUMP BYPASS VALVE ARRANGEMENT

John W. Irwin, Trenton, N.J., assignor to General Electric Company, Louisville, Ky.

Filed Aug. 14, 1978, Ser. No. 933,332
Int. Cl.[2] F25B *13/00*
U.S. Cl. 62—324 **3 Claims**

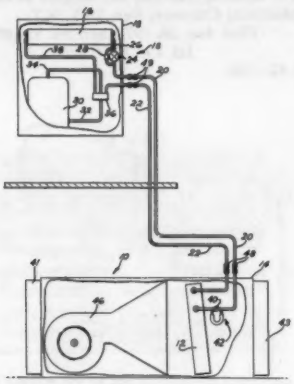
1. A split refrigeration system air conditioner of the heat pump type including an outdoor section having an outdoor heat exchanger and an indoor section having an indoor heat exchanger, said indoor and outdoor heat exchanger being connected in a closed refrigerant circuit;

means in said circuit including a compressor having a discharge line and a suction line and reversing valve means for reversibly connecting said discharge and suction line to said heat exchangers for effecting flow of refrigerant through said circuit in either direction whereby said heat pump may be operated on a cooling cycle with the outdoor coil functioning as a condenser and receiving high pressure refrigerant from said compressor or in a heating cycle with the indoor coil functioning as a condenser and receiving high pressure refrigerant from said compressor;

an outdoor refrigerant flow control means arranged in fixed

relationship relative to said outdoor heat exchanger, and outdoor conduit means arranged for bypassing refrigerant around said outdoor flow control means when said refrigerant flow is in a direction from said outdoor heat exchanger toward said outdoor flow control means;

an indoor refrigerant flow control means arranged in fixed relationship relating to said indoor heat exchanger, and indoor conduit means arranged by bypassing refrigerant



around said indoor flow control means when refrigerant flow is in a direction from said indoor heat exchanger toward said indoor flow control means;

said indoor conduit means having a first and second portion;

said portions having their axis arranged so that a horizontal plane passes through the intersecting point of the two respective axes;

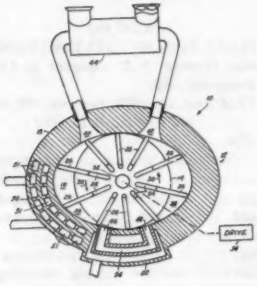
said axes extending from said intersecting point at a predetermined angle from said horizontal plane.

4,187,692

LIQUID COOLED ROTARY VANE AIR CYCLE MACHINE

Lawrence L. Midolo, 1475 Black Oak Dr., Centerville, Ohio 45459

Filed May 3, 1978, Ser. No. 902,524
Int. Cl.² F25D 9/00
U.S. Cl. 62—402 **1 Claim**



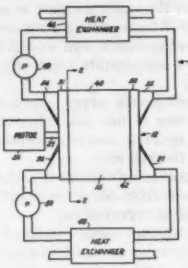
1. A rotary vane air cycle apparatus, comprising: a compressor and an expander driven by a common shaft; said compressor and expander including a rotor having vanes which form a plurality of cells which change in volume as the shaft rotates; said compressor having an inlet port and an outlet port; said expander having an inlet port and an outlet port; and means for supplying a gas to the compressor inlet port; a passage interconnecting the compressor outlet port and the expander inlet port; means, adjacent said compressor for cooling the gas in said compressor during compression of the gas; said means for cooling the gas in the compressor including a liquid cooled heat exchanger; means for supplying cooling liquid to said heat exchanger; a liquid cooled heat exchanger surrounding the passage between the compressor outlet port and the expander inlet port.

4,187,693

CLOSED CHAMBER ROTARY VANE GAS CYCLE COOLING SYSTEM

Ronald E. Smolinski, 4081 Forest Ridge, Dayton, Ohio 45424

Filed Jun. 15, 1978, Ser. No. 915,707
Int. Cl.² F25D 9/00
U.S. Cl. 62—402 **5 Claims**



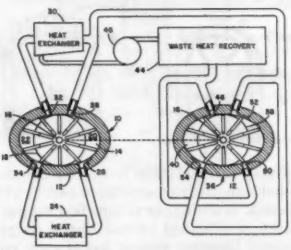
1. A rotary vane gas cycle cooling system, comprising: a compressor and an expander driven by a common shaft, said compressor and expander including a rotor, rotatably mounted on said shaft; said rotor having radially slidable vanes which form a plurality of cells which change in volume as the rotor rotates; said rotor being positioned within a closed chamber with said shaft being displaced from the center of said chamber; means for cooling the gas in said compressor and means for adding heat to the gas in said expander.

4,187,694

BINARY WORKING FLUID AIR CONDITIONING SYSTEM

Lawrence L. Midolo, 1475 Black Oak Dr., Centerville, Ohio 45459

Filed Nov. 21, 1978, Ser. No. 962,742
Int. Cl.² F25D 9/00
U.S. Cl. 62—402 **9 Claims**



1. A compartment cooling system for vehicles driven by an internal combustion engine, comprising: a compressor and an expander driven by a common drive shaft; said compressor having an inlet port and an outlet port; said expander having an inlet port and an outlet port; a turbine connected to said common drive shaft; means for supplying a noncondensible gas to

the inlet port of said compressor; a heat rejection heat exchanger connected between the outlet of said compressor and the inlet of said expander; means for supplying a super heated condensible fluid vapor to said turbine; said means for supplying a superheated condensible fluid vapor to said turbine including a vaporizable liquid and means for vaporizing and superheating the vaporizable liquid with waste heat from the internal combustion engine; said turbine having a fluid outlet connected to the outlet of said compressor, means for connecting said vaporizing and superheating means to said heat rejection heat exchanger adjacent the inlet port of said expander.

4,187,695

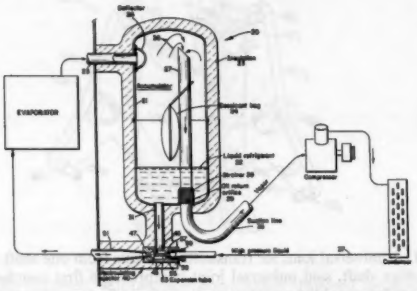
AIR-CONDITIONING SYSTEM HAVING RECIRCULATING AND FLOW-CONTROL MEANS

Ernest W. Schumacher, DeSoto, Tex., assignor to Virginia Chemicals Inc., Portsmouth, Me.

Filed Nov. 7, 1978, Ser. No. 958,368

Int. Cl.[2] F25B *43/00*

U.S. Cl. 62—503 **12 Claims**



1. In an air conditioning apparatus of the vapor compression type, comprising: an evaporator, an accumulator, a compressor, a condenser, and an expansion tube through which high-pressure liquid is expanded into said evaporator, the improvement comprising, in combination with said expansion tube and said accumulator:

A. an ejector block having a first side entrance, a longitudinal opening in which said expansion tube is coaxially disposed, and an inner cavity into which said expansion tube empties and with which said side entrance is connected;

B. a connection between said side entrance and an opening in the bottom of said accumulator; and

C. a diverging tube which is connected at its narrow end to said inner cavity and at its wide end to said evaporator, whereby said ejector block, said expansion tube, said side entrance, and said diverging tube form, in combination, an ejector means for ejecting liquid from said accumulator and for injecting said accumulated liquid, mixed with said expanded high-pressure liquid, into said evaporator.

4,187,696

EAR ORNAMENT CLIPS

Johannes A. W. P. van Bergen, Stollenbergweg 156, Berg en Dal, Netherlands

Continuation-in-part of Ser. No. 849,044, Nov. 7, 1977, which is a continuation of Ser. No. 724,970, Sep. 20, 1976, abandoned.

This application Nov. 25, 1977, Ser. No. 854,635

Claims priority, application United Kingdom, Oct. 1, 1975, 40113/75

Int. Cl.[2] A44B *21/00*

U.S. Cl. 63—14 C **5 Claims**

1. An ear ornament clip comprising:

a front part and back part, said front and back parts being so connected to one another as to permit angular movement of said parts relative to each other in order to grip or release a wearer's ear lobe;

said front part having a first portion of which a first face is adapted to carry the ornament and of which a second face is adapted to be placed in contact with that first surface of the wearer's ear lobe against which said ornament is to be displayed;

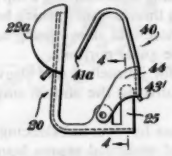
said front part having a second portion integral with said first portion and including elements which are so joined to one another at corresponding one ends thereof as to form resilient elements substantially in the form of a V, the corresponding other and free ends of said elements extending substantially parallel to said first portion of said front part;

said back part having a first portion which includes a third face of which at least a portion thereof is adapted to be placed in contact with that second surface of the wearer's ear lobe which is remote from said surface thereof against which said ornament is to be displayed;

said third face and said second face forming an acute angle with each other when placed in contact with said first and second surfaces;

said back part having a second portion which is integral with said first portion thereof and which comprises substantially parallel legs;

said front part having first means disposed near said resilient elements and said back part having second means disposed



near the free ends of said legs, said first and second means cooperating to form a pivotal connection between said front and back parts;

relative angular movement of said front and back parts to a condition in which an ear lobe becomes gripped between said first portion of said front part and said first portion of said back part causing the lobe-gripping portions of said front and back parts of said clip to become disposed substantially directly opposite to each other, and also causing the inside surface of said legs to frictionally slide along the outside surfaces of said resilient elements towards said free ends of said resilient elements and to force said resilient elements together to establish and maintain the desired lobe-gripping condition of said front and back parts;

said first portion of said back part being substantially U-shaped with diverging legs;

said U-shaped first portion of said back part including a first diverging leg having a free end and a second diverging leg which is integral with said second portion of said back part; and

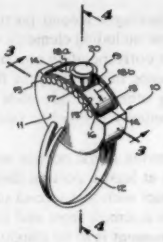
said free end of said first diverging leg comprising said lobe contacting portion of said first portion of said back part, the remainder of said first diverging leg being configured such that, when in place against the ear lobe, said third face will diverge sufficiently from the lobe to be accessible to the wearer for manual application of a pulling force thereagainst to remove the ear ornament clip.

4,187,697

JEWEL MOUNTING STRUCTURE

Angel Castelo, 9477 Brighton Way, Beverly Hills, Calif. 90210

Filed Oct. 16, 1978, Ser. No. 951,718
Int. Cl.[2] A44C 17/02, 9/02
U.S. Cl. 63—31 10 Claims



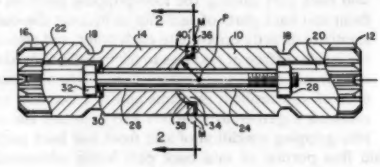
1. A jewel mounting structure comprising:
(a) a housing having an internal cavity and a substantially longitudinal opening at the top thereof;
(b) a shaft secured within the cavity of said housing and being disposed perpendicular to the longitudinal opening in said housing;
(c) a mounting guide including a guide portion having a uniform radius of curvature, said mounting guide being coupled to said housing within the opening therein, the interval between the guide portion and said shaft being equal to radius of curvature of said guide portion;
(d) a jewel mounting sleeve having a top and bottom surface and an opening therein, said opening being disposed about the guide portion, said sleeve being adapted to slideably move along the guide portion;
(e) pivot means for journeling said sleeve about said shaft, said means secured to the bottom surface of said sleeve; and
(f) weighted means for counterbalancing said jewel mounting sleeve, said weighted means being coupled to said pivot means on the diametrically opposed side of said shaft.

4,187,698

COUPLING FOR MISALIGNED SHAFTS

John F. Ohlson, 48 Judie La., Ambler, Pa. 19002

Filed Jun. 12, 1978, Ser. No. 914,311
Int. Cl.[2] F16D 3/18, 3/54
U.S. Cl. 64—9 R 10 Claims



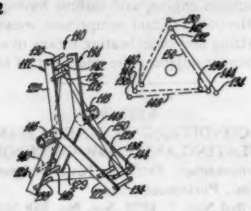
1. A coupling device for transmitting torque along the axes of rotation of a drive unit and a load respectively, comprising:
a pair of longitudinal members having mating proximal ends and formed to be connected respectively at the distal ends thereof to the drive unit and the load, and having mating spherical surfaces on the respective proximal ends thereof surrounded by a plurality of intermeshing axial teeth; and
urging means extending along the axes of said members and yieldingly connected therein for axially forcing said surfaces into sliding contact.

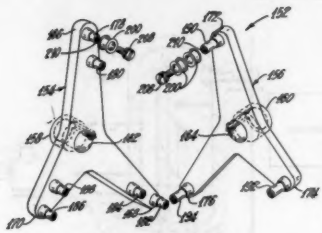
4,187,699

UNIVERSAL JOINT FOR CONNECTING SHAFTS

Warren W. Weible, Defiance, Ohio, assignor to The Zeller Corporation, Defiance, Ohio

Division of Ser. No. 736,863, Oct. 29, 1976, abandoned. This application Aug. 21, 1978, Ser. No. 935,088
Int. Cl.[2] F16D 3/58, 3/62, 3/54
U.S. Cl. 64—12 6 Claims





1. A universal joint for transmitting torque from one shaft to another shaft, said universal joint comprising a first member, means for attaching a central portion of said first member to an end of one of said shafts to be positioned transversely to the longitudinal extent of said shaft, a second member, means for attaching a central portion of said second member to an end of the other of said shafts to be positioned transversely to the longitudinal extent of said other shaft, said first member having at least three first extremities extending transversely outwardly beyond the shaft, said second member having at least three second extremities extending transversely outwardly beyond the other shaft, each of the first extremities of said first member having a first projection extending toward said second member, said first projections being at the same distance from the central portion of said first member, each of said second extremities having two second projections, including an outer second projection and an inner second projection, said outer second projections being at the same distance from the central portion of said second member, which distance is more than the distance of said first projections, said inner second projections being at the same distance from the central portion of said second member, which distance is less than the distance of said first projections, and flexible bridging means connecting rotationally-spaced first and second projections of said members, said bridging means connecting said first projections to rotationally displaced inner second projections in one direction and to outer rotationally spaced second projections in the other direction.

4,187,700

LATCH GUARD AND DEEP PILE FABRIC CIRCULAR KNITTING MACHINE FITTED THEREWITH

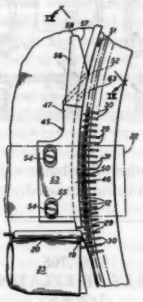
Ralph A. Koegel, Brookfield, Wis., assignor to Borg Textile Corporation, Oak Brook, Ill.

Filed Nov. 3, 1977, Ser. No. 848,100
Int. Cl.[2] D04B 9/14
U.S. Cl. 66—111 7 Claims

1. A latch guard assembly for a circular knitting machine having a rotatable cylinder means with a fixed outside radius

and with needles rotatable in a predetermined projected path with said cylinder means, said latch guard assembly being adapted to eliminate stray fiber build up on the front edge of prior art latch guards during operations of such knitting machine, said latch guard comprising

(A) an arcuate, elongated guard member having a longitudinal radius of curvature associated with an inside face thereof which is generally somewhat larger by a preselected amount than said outside radius of said predetermined projected circumferential path assumed by each of said needles that are functionally associated with outside upper rim portions of a said cylinder means, a longitudinally forward upper end portion of said guard member, relative to a predetermined direction of rotation of said cylinder means, terminating in a circumferentially more forwardly spatial position than a longitudinally forward circumferentially lower end portion thereof,



(B) flattened, substantially horizontally disposed deflector means integrally associated therewith and projecting forwardly from said longitudinally forward upper end portion thereof to a deflector means end, said deflector means being adapted to eliminate pointed regions associated with said latch guard whereon fiber members can accumulate and being further adapted to guide loosened fiber members into positions circumferentially adjacent said cylinder means, during operation of said circular knitting machine, said deflector means being so located relative to said guide member that said deflector means end is from about 0.5 to 2 centimeters radially from said projected path, and also is from about 1 to 4 centimeters longitudinally from said longitudinally forward upper end portion, and

(C) mounting means for mounting said latch guard to a predetermined machine support means in a predeterminable relationship to said cylinder means.

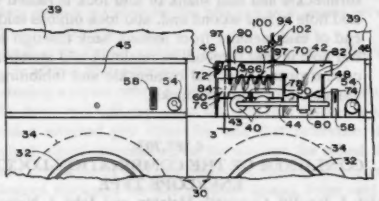
4,187,701

LAUNDRY HOT WATER SUPPLY SYSTEM AND APPARATUS

Ion L. Wendel, St. Petersburg, Fla., assignor to WenLo Corporation, St. Petersburg, Fla.

Filed Feb. 23, 1976, Ser. No. 660,323
Int. Cl.[2] D06F *31/00, 39/04, 58/00*
U.S. Cl. 68—20 **12 Claims**

1. In a laundry dryer for use in association with a clothes washer and wherein the dryer includes a laundry chamber for receiving laundry to be dried, a heating unit for heating gas to be delivered to said laundry chamber to dry laundry therein, said heating unit including a casing and heating means in said casing for heating gas to be delivered to said laundry chamber, said heating means including a gas burner having gas orifices; the improvement comprising water handling means including a water conduit positioned in said casing adjacent said gas orifices of the burner for heating water in the conduit for use in a clothes washing operation simultaneously with the heating of gas to be delivered to said laundry chamber, said water conduit including a coil having a plurality of upper runs and a plurality of lower runs lying in generally parallel planes with the upper



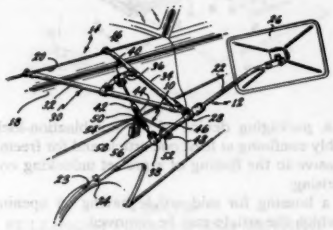
runs being interconnected to the lower runs and all of the runs are located within the heating chamber to the associated heating unit.

4,187,702

LOCKING ADAPTER FOR TRAILER TOWING MIRROR

Marvin E. Benton, 1252 E. Willow, Anaheim, Calif. 92806

Filed Sep. 25, 1978, Ser. No. 945,304
Int. Cl.[2] E05B *65/00*
U.S. Cl. 70—57 **7 Claims**



1. A locking device for locking a trailer towing mirror to a vehicle, the trailer towing mirror of the type having at least two supports, one support hinged upon the other support,

a turnbuckle attaching to and capable of maintaining said supports in a fixed relationship with respect to one another and to the vehicle to which the trailer towing mirror is attached,

said turnbuckle of the type having a right-hand threaded hole in one end and a left-hand threaded hole in the other end, and a central opening, the improvement which comprises:

an elongated member having a first end and a second end;

said elongated member being formed of a material substantially resistant to sundering;

said first end of said member including a first hole;

said first hole dimensioned such that one of said supports fits through said first hole retaining said elongated member on said support;

said second end of said elongated member including a second hole;

said second end of said member being dimensioned such that at least a portion of said second end of said member is capable of passing through said central opening in said turnbuckle;

said second hole positioned in said second end such that when said second end is passed through said central opening in said turnbuckle,

said hole in said second end lies on the opposite side of said turnbuckle from the majority portion of said elongated member;

a lock;

said lock including a shank;

said hole in said second end dimensioned to receive said

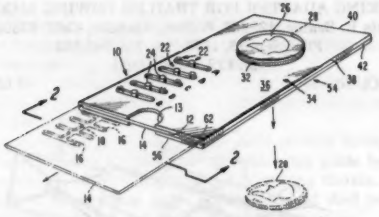
shank of said lock such that when said second end of said member is passed through said central opening in said turnbuckle and said shank of said lock is passed through said hole in said second end, said lock inhibits said second end of said member from passing back through said central hole in said turnbuckle, retaining said member in said central opening in said turnbuckle and inhibiting rotary movement of said turnbuckle.

4,187,703

CONTAINER OF THE COMBINATION-LOCKED ENVELOPE TYPE

Ralph J. Ippoliti, Cornwells Heights, and John J. Nelson, Bristol, both of Pa., assignors to Product Dynamics, Ltd., Levittown, Pa.

Filed Sep. 20, 1978, Ser. No. 944,234
Int. Cl.[2] E05B *37/16, 65/52*
U.S. Cl. 70—63 **17 Claims**



1. A packaging device of the combination-lock type for lockably confining at least one article and for freeing the same responsive to the finding of a pre-set unlocking combination, comprising:

(a) a housing for said article having an opening through which the article may be removed;

(b) means within the housing normally extending as a barrier across the opening; and

(c) a plurality of locking keys mounted in the housing in locking engagement with said means and operable through a pre-set combination to free said means for movement to a position in which the opening is uncovered and the article is freed for removal from the housing.

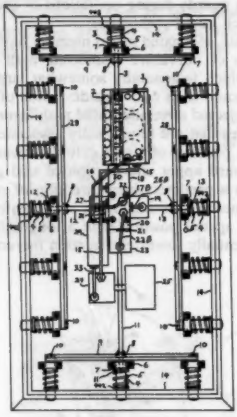
4,187,704

HYDRAULIC LOCKING SYSTEM

Spasoje Ristic-Petrovic, 860 Royal Oak Ave., Victoria, B.C., Canada (V8X 3T2)

Filed Apr. 11, 1977, Ser. No. 786,413
Claims priority, application Canada, Jun. 14, 1976, 254783
Int. Cl.[2] E05B *51/02*
U.S. Cl. 70—263 **12 Claims**

1. A hydraulically operated locking system comprising a pressurized fluid source, a master control valve and a slave valve each connected to said pressurized fluid source, a movable locking member, a piston cylinder assembly operatively associated with said slave valve and connected to the locking member for moving the same upon actuation of the slave valve and said slave valve being operatively associated with said master control valve for actuation thereby, said master control valve comprising a plurality of valves operatively interrelated and interconnected by passage means in series parallel relation such that, when selected ones thereof are operated in a predetermined sequence, they cause operation of the other ones of the interrelated valves so as to allow the pressurized fluid to flow through said passage means to the slave valve actuating the latter and means for actuating selected ones of said plurality of valves for operating the same in random sequence including said preselected sequence, said actuating means comprising a plurality of distributor valves arranged in at least one group and means for actuating the distributor valves individually and only one at a time in each group, said actuating means precluding operation of the other distributor valves when one of the valves in that group is being actuated.

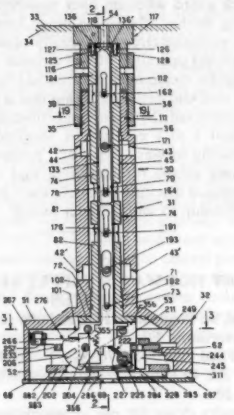


4,187,705

IMPROVEMENTS IN OR RELATING TO BRAMAH LOCKS

Francois Guiraud, Chambourcy, France, assignor to Fichet-Bauche French Body Corporation, Velizy, France

Filed Mar. 20, 1978, Ser. No. 888,198
Claims priority, application France, Mar. 24, 1977, 77 08877
Int. Cl.[2] E05B *29/00*
U.S. Cl. 70—362 **21 Claims**



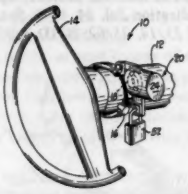
1. A Bramah lock for a door of a safe-deposit box or an armored door, comprising a locking and unlocking mechanism actuatable by motion transmitting members formed as bars disposed in at least two serially arranged sets extending through the door to a keyhole and co-operable by abutment from the keyhole to the locking and unlocking mechanism so that displacements towards the keyhole of motion transmitting members relatively adjacent to the keyhole are not transmitted to motion transmitting members relatively remote therefrom.

4,187,706

ANTITHEFT GUARD FOR IGNITION SWITCH

John C. Hill, 11604 Thornwood, Cleveland, Ohio 44108

Filed Dec. 22, 1977, Ser. No. 863,084
Int. Cl.[2] E05B *17/14*
U.S. Cl. 70—428 1 Claim



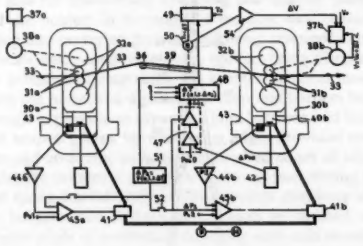
1. An antitheft device for an automobile comprising:
(a) a pair of arcuately contoured pipe sections each adapted partially to encircle and engage a steering column;
(b) a first hinge fixed to the pipe sections and having a pivot axis adapted to parallel the axis of such steering column such that the sections may be brought into a column engaging position in coaxial relationship with the column;
(c) an ignition switch covering cup connected to one of the sections by a second hinge and including an annular pipe section having an end opening defined by an end wall adapted to engage such steering column with the cup pipe section positioned in ignition lock surrounding relationship;
(d) the cup including structure closing its end remote from said end wall to prevent ignition lock tampering when the cup is positioned over such lock;
(e) the second hinge permitting pivoting of the cup about a fixed location second hinge axis to provide ignition lock access without removal of the antitheft device from a steering column when its automobile is in use but adapted to deny ignition lock access when the cup is secured in this theft inhibiting position; and,
(f) a pair of apertured ears respectively fixed to the cup and the other of the pipe sections, the ears each including a lock receiving aperture with the apertures adapted to be aligned and receive a padlock or the like to fix the cup over an ignition lock when the antitheft device is in use.

4,187,707

THICKNESS CONTROL METHOD AND APPARATUS FOR A ROLLING MILL

André Quehen, Paris, France, assignor to SECIM, Courbevoie, France

Filed Sep. 25, 1978, Ser. No. 945,674
Claims priority, application France, Sep. 26, 1977, 77 28873
Int. Cl.[2] B21B *37/00*
U.S. Cl. 72—8 10 Claims



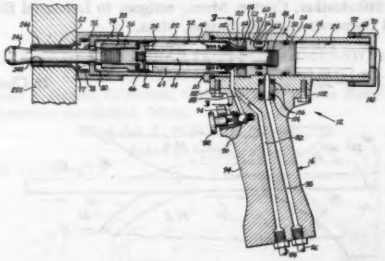
1. A process for controlling the thickness of a flat product being rolled by a continuous hot tandem rolling mill having a first reference stand, and a second reference stand upstream from said first reference stand in which the following steps are continuously performed:
with respect to at least said first stand, maintaining a constant rolling pressure on the product as it passes between the rolls thereof,
measuring the gap or a change in the gap between the work rolls of said first reference stand,
producing a signal representative of the difference between the measured roll gap value for said first reference stand and a selected gap value for said first reference stand, which signal corresponds to the amount the rolled thickness produced by said first reference stand differs from the desired thickness for the product issuing from said first reference stand,
employing said difference signal by itself or with other variables such as thickness, width or temperature of the product to produce a signal representing the corrective tensile force that must be exerted on the product as it passes between said first and second reference stands to cause the roll gap of said first reference stand to be adjusted until it produces a product of said desired thickness, and
employing said tensile force signal to operate a means for exerting a tensile force on said product passing between said first and second reference stands for effecting said gap adjustment.

4,187,708

PULLING APPARATUS AND METHOD

Louis A. Champoux, Seattle, Wash., assignor to Industrial Wire & Metal Forming, Inc., Tukwila, Wash.

Filed Apr. 11, 1977, Ser. No. 786,096
Int. Cl.[2] B21D *39/08*
U.S. Cl. 72—30 26 Claims



1. A pulling apparatus comprising: a cylindrical housing, a pair of sealed pistons slideably mounted inside the housing and joined to a common shaft, a stationary member inside the housing having an opening through which the shaft sealingly extends and with the stationary member acting as a divider, a working unit to move as the shaft with pistons move, means for introducing compressed air into a space between a first one of the pair of pistons and the divider to move the working unit to starting position, and means for exhausting air out of the space between the first piston and the divider and for introducing a hydraulic fluid under pressure into a space between a second one of the pair of pistons and the divider to pull on the working unit and perform work on a work piece.

4,187,709

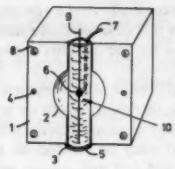
EXPLOSIVE FORMING

Roland A. Legate, Hitchin, England, and Kevin Strickland, 28 Hazel Grove, Stotfold, Hitchin, Hertfordshire, England, assignors to Kevin Strickland, Hitchin, England

Division of Ser. No. 716,564, Aug. 23, 1976, abandoned. This application Jan. 24, 1978, Ser. No. 871,836

Int. Cl.[2] B21D *26/02*

U.S. Cl. 72—56 4 Claims



1. A method of forming a hollow spherical article having at least two substantially diametrically opposed apertures in the spherical surface, said article being of wrought metal said method comprising placing an open ended tube of wrought metal in a die with the interior of said tube communicating with the exterior of said die, positioning a plurality of explosive charges within the tube and sequentially detonating the explosive charges to act directly on and expand the tube into said hollow spherical article having two cylindrical portions extending generally radially from opposed sides of said article, said cylindrical portions defining said substantially diametrically opposed apertures in said surface.

4,187,710

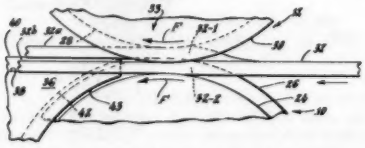
METHOD AND APPARATUS FOR SIMULTANEOUSLY ROLLING AND SLITTING METAL STRIP

Allan Stikeleather, Canton, Mass., assignor to Industrial Blast Coil Corporation, South Easton, Mass.

Filed Jun. 12, 1978, Ser. No. 914,447

Int. Cl.[2] B21B *1/00*

U.S. Cl. 72—204 25 Claims



1. The method of slitting one metal strip of predetermined thickness and a width at least several times its thickness into a plurality of substrips in a rolling zone which comprises:

compressively working said strip across its entire width in one rolling zone, thereby reducing its thickness; and

in the same rolling zone separating said strip along at least one plane perpendicular to its major surfaces and parallel to its longitudinal centerline by displacing the metal on opposite sides of each such plane in opposite directions perpendicular to said major surfaces for offsetting the portions of the metal on opposite sides of each such plane above and below each other for forming a plurality of substrips each of which is thinner than said strip.

4,187,711

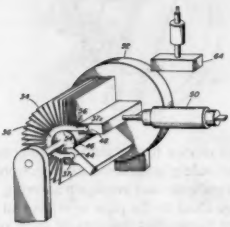
METHOD AND APPARATUS FOR PRODUCING A HIGH FIN DENSITY EXTRUDED HEAT DISSIPATOR

Ronald B. Lavochkin, Newton, and Thomas D. Coe, Boxford, both of Mass., assignors to Wakefield Engineering, Inc., Wakefield, Mass.

Continuation-in-part of Ser. No. 790,621, Apr. 25, 1977, abandoned. This application Jul. 24, 1978, Ser. No. 927,206

Int. Cl.[2] B21C *23/14, 25/02;* B21D *3/00, 25/04*

U.S. Cl. 72—256 6 Claims



1. The method of manufacturing an integral heat dissipator having high density fins extending from a surface of a base comprising:

extruding the integral heat dissipator with a partial cylindrical base having the fins extending substantially radially from the outer cylindrical surface of the base;

placing the said extruded heat dissipator about a mandrel;

securing one end of the base to the mandrel;

securing the other end of the base to a means for applying a tensile stress to the base in a plane tangent to the mandrel at a line of tangency;

braking rotation of the mandrel while applying the tensile stress to rotate the mandrel thereby gradually straightening the dissipator;

after the base has been substantially straightened stopping further rotation of the mandrel; and

increasing said tensile stress to a value slightly above the yield point to further strain straighten the base of the heat dissipator.

4,187,712

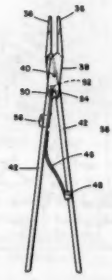
HEMOSTATIC CLIP APPLICATOR

Peter B. Samuels, 14708 Sutton St., Sherman Oaks, Calif. 91403, and Ernest C. Wood, 2461 Ivanhoe Dr., Los Angeles, Calif. 90039

Division of Ser. No. 786,021, Apr. 8, 1977, Pat. No. 4,146,130. This application Dec. 4, 1978, Ser. No. 966,321

Int. Cl.[2] B21D *7/06*

U.S. Cl. 72—410 3 Claims



1. In a clip applicator including a pair of opposed crimping jaws adapted to receive and crimp a hemostatic clip, said jaws

secured for relative movement of a boxed hinge, arms having finger holes at the end thereof attached to said jaws to permit manual relative movement of said jaws and a spring means for biasing the jaws to an open position in the absence of manual pressure, the improvement comprising:

means for preventing said jaws from opening more than a selected distance, said selected distance corresponding to the correct distance for receiving a clip in said jaws, said preventing means including:

(a) a locking bar secured to one of said arms,

(b) slots provided through the arm portions of said boxed hinge, said slots being dimensioned and positioned relative to each other and said locking bar that when said jaws are at said selected distance said slots are in alignment,

said locking bar being dimensioned to pass into the aligned slots to thereafter prevent opening of said jaws beyond said selected distance.

4,187,713

QUICK CHUCKING DIE HOLDER DEVICE FOR FORGING PRESSES

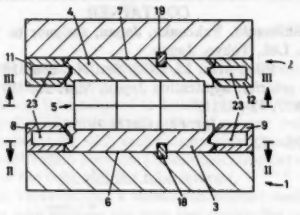
Georg Fellner, Am Tale 4, D-7203 Fridingen, Fed. Rep. of Germany

Filed Apr. 10, 1978, Ser. No. 894,680

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1977, 2716023

Int. Cl.[2] B21J *13/02*

U.S. Cl. 72—446 **13 Claims**



1. In a quick chucking die holder device for forging presses having a lower die holder for fastening to the press bed and an upper die holder for fastening to the ram, said die holders containing lower and upper dies making at least two molds so as to form individual work pieces successively by one stroke of the ram each, the improvement comprising a lower and an upper adapter plate containing said dies in fast relation, centering gibs for transversely centering said adapter plates within said die holders in horizontal directions, said centering gibs fitting into centering grooves and being arranged between the ultimate and penultimate mold, borders being disposed on the die holders and embracing the adapter plates at least on two sides, the horizontal distance between said borders being great enough to provide an expansion joint between said borders and said adapter plates, bevelled inner edges provided on the borders and co-acting with similar bevelled edges of said adapter plates for centering same in a coarse manner during insertion, and spring-loaded horizontally movable chucking wedges in the borders, said wedges having each an inclined surface of greater angle of inclination co-acting with said bevelled edges of said adapter plates and an inclined surface of minor angle of inclination co-acting with chucking surfaces of said adapter plates to thereby clamp said adapter plates onto said die holders.

4,187,714

SURFACE FRICTION TESTER

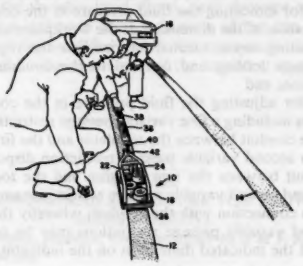
Myron K. Cox, Fairborn; William J. McGrath, Dayton, and James E. Cantrill, Fairborn, all of Ohio, assignors to Wright State University, Dayton, Ohio

Continuation of Ser. No. 845,550, Oct. 26, 1977, abandoned.

This application Oct. 10, 1978, Ser. No. 949,611

Int. Cl.[2] G01N *19/02*; G01P *3/00*

U.S. Cl. 73—9 **9 Claims**



1. A portable surface friction tester in the form of a friction sled comprising:

(a) a frame having a relatively flat rectangular base plate with front and rear edges of a lesser dimension than the lateral edges thereof and having side bars elevated above said base plate, said side bars extending substantially the length of said base plate along each lateral edge and joined to said base plate at each corner of the rear edge and the lateral edge, said bars also converging beyond said front edge to form a tongue;

(b) a friction surface attached to the bottom of said base plate and characterizing a vehicle tire tread,

(c) weight means supported by said frame for loading said friction sled,

(d) pull means connected to said tongue by which said friction sled can be pulled over the surface to be tested, and

(e) a scale intermediate said pull means and said tongue to provide a measurement giving the coefficient of friction of the surface to be tested as said friction sled is pulled in a smooth, steady state over that surface.

4,187,715

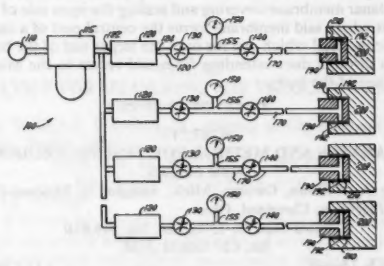
METHOD AND APPARATUS FOR DIMENSIONAL GAGING WITH FLUID PRESSURE

James S. Nevitt, Bellbrook, Ohio, assignor to The Bendix Corporation, Southfield, Mich.

Filed Jul. 7, 1978, Ser. No. 922,705

Int. Cl.[2] G01B *13/10*

U.S. Cl. 73—37.9 **5 Claims**



1. A fluid pressure gaging apparatus for indicating a dimension of a workpiece surface, said apparatus comprising:

a fluid pressure regulator having an input and an output, said regulator adapted to receive a pressurized fluid at the input and to provide the fluid at a regulated pressure at the output;

gage tooling including at least one opening formed in said gage tooling and directed at the workpiece surface;

a fluid conduit connecting the output of the regulator with the gage tooling, said gaging tooling provides a fluid back pressure in the fluid conduit which varies with the distance between the opening and the workpiece surface;

means for indicating the fluid pressure in the conduit as an indication of the dimension of the workpiece surface, said indicating means located intermediate the regulator and the gage tooling and coupled to the conduit at a first location; and

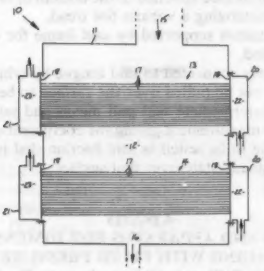
means for adjusting the fluid pressure in the conduit, said means including a first variable passage restriction located in the conduit between the regulator and the first location and a second variable passage restriction disposed in the conduit between the first location and the tooling, said first and second variable passage restrictions each being in series connection with the conduit, whereby the first and second variable passage restrictions may be adjusted to adjust the indicated dimension on the indicating means.

4,187,716

CONDENSER LEAK SEARCHING PLUGS

Robert Simpson, 84B Eglinton Rd., Ardrossan, Ayrshire, Scotland

Continuation of Ser. No. 733,854, Oct. 19, 1976, abandoned.
This application Mar. 15, 1978, Ser. No. 886,933
Claims priority, application United Kingdom, Oct. 22, 1975, 43244/75
Int. Cl.[2] G01M *3/28*
U.S. Cl. 73—40 **3 Claims**



1. An appliance for detecting leakage from coolant tubes to a condensate space in a vapour condenser comprising a plug having a tapered body, a recess extending into the body from the larger end face thereof, a resiliently yieldable non protruding planar membrane covering and sealing the open side of said recess where said membrane forms the central part of a cap of elastic material which cap fits over the larger end of the body, and a through duct extending from said recess to the smaller end face of the body.

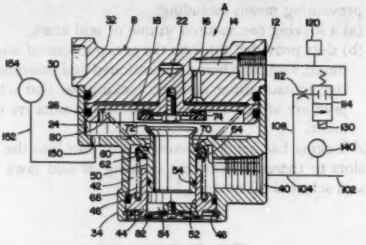
4,187,717

APPARATUS AND METHOD FOR TESTING PRODUCTS FOR LEAKS

Larry A. Wilhelm, Owosso, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Jun. 19, 1978, Ser. No. 916,610
Int. Cl.[2] G01M *3/28*
U.S. Cl. 73—46 **11 Claims**

1. Testing apparatus for determining leakage in products to which primary and secondary air is supplied at substantially different pressures comprising: a supply air source having a supply pressure substantially greater than atmospheric, primary air supply means for supplying primary air from said supply air source to a test product at a primary air pressure substantially greater than atmospheric, secondary air supply means for supplying secondary air from said supply air source to a test product, said secondary air supply means including sensing means for sensing the secondary air pressure in a test



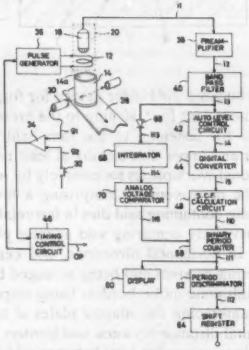
product, said secondary air supply means including valve means for opening and closing flow of secondary air to a test product, said valve means being responsive to said sensing means for supplying and maintaining in a test product a predetermined secondary air pressure above atmospheric and substantially less than said primary air pressure, and flow means for indicating flow from said supply air source to said primary and secondary air supply means.

4,187,718

METHOD AND APPARATUS FOR INSPECTING AN INTERNAL PRESSURE OF HERMETICALLY SEALED CONTAINER

Kyuichi Shibasaki, Yokosuka, Japan, assignor to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Mar. 13, 1978, Ser. No. 886,010
Claims priority, application Japan, Mar. 26, 1977, 52-32820; Dec. 5, 1977, 52-145169
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—52 **21 Claims**



1. A method of inspecting the internal pressure of a hermetically sealed container consisting of the following steps: a free vibration is compulsorily excited on the elastic wall of a hermetically sealed container, the excited vibration is converted and detected as an electrical signal, the intrinsic self-correlation function of the detected signal itself is calculated through analysis and arithmetic operation including a processing for compressing logarithmicly the amplitude of the relevant detected signal, and the adequacy of the internal pressure is

discriminated as an output in accordance with the measured period obtained from the relevant self-correlation function.

4,187,719

APPARATUS TO DETERMINE THE SEDIMENTATION RATE OF RED BLOOD CELLS

Ulrich Brethauer, Melsungen, Fed. Rep. of Germany, assignor to B. Braun Melsungen Aktiengesellschaft, Melsungen, Fed. Rep. of Germany

Filed Jul. 31, 1978, Ser. No. 929,287

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1977, 7724900[U]

Int. Cl.² G01N *15/04, 33/16*

U.S. Cl. 73—61.4 **3 Claims**

1. Apparatus for the determination of the sedimentation rate of red blood cells, comprising:

a sedimentation tube adapted to hold a blood column,

a closure valve of elastomeric material on one end of the sedimentation tube with said closure valve having a self-sealing perforation providing communication between the outside of the tube and the tube interior,

said closure valve having a hollow recess surrounded by a wall into which recess the tube end tightly fits, and

an extension plug, located in the other end of the tube, having a recess to receive the end of a syringe to inject liquid into the tube, and an orifice extending from the recess into the tube interior space.

4,187,720

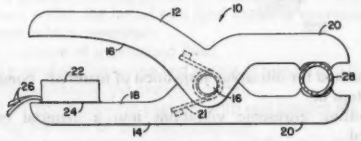
FUEL LINE INJECTION SENSOR

Keith R. Baker, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Nov. 6, 1978, Ser. No. 957,901

Int. Cl.² G01M *15/00*

U.S. Cl. 73—119 A **13 Claims**



1. A device for sensing pulsating fluid flow caused vibrations in a conduit and providing a signal indicative of one or more characteristics of the flow in the conduit, the device comprising:

self-closing and manually releasable clamp means adapted to be clamped to the conduit so that vibrations in the conduit are transmitted to the clamp;

pickup means mounted on the clamp means for providing a variable level signal indicative of the vibrations; and

signal processing means connected to the pickup means for receiving the variable level signal and providing an output indicative of a characteristic of the flow in the conduit,

the signal processing means comprising first circuit means for amplifying the variable level signal, peak detector means for establishing a reference level indicative of but less than the peak level of the amplified signal, and comparator means for comparing the reference level and the amplified signal.

4,187,721

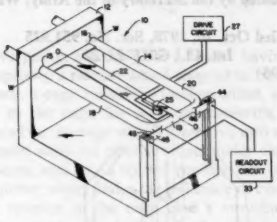
METHOD AND STRUCTURE FOR FLOW MEASUREMENT

James E. Smith, Boulder, Colo., assignor to S & F Associates, Boulder, Colo.

Continuation-in-part of Ser. No. 818,475, Jul. 25, 1977, abandoned. This application Jul. 20, 1978, Ser. No. 926,468

Int. Cl.² G01F *1/86*

U.S. Cl. 73—194 B **55 Claims**



51. A method for measuring flow of a material comprising:

flowing the material through a "U" shaped conduit;

oscillating the conduit around an axis of oscillation passing through the legs of the conduit at substantially equal angles; and

measuring the forces tending to deflect the "U" shaped conduit around a deflection axis perpendicular to the oscillation axis and symmetrical to the conduit by determining the time lag between the passage of one side of the conduit through a plane substantially at the midpoint of oscillation and the passage of the other side of the conduit through such plane.

4,187,722

DEVICE FOR MEASURING THE VELOCITY OF A URINE DISCHARGE

Terry N. Layton, Wheeling, Ill., assignor to The Kendall Company, Boston, Mass.

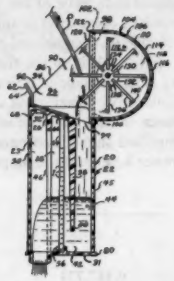
Filed Mar. 22, 1978, Ser. No. 889,153

Int. Cl.² A61B *5/00*; G01F *1/06*

U.S. Cl. 73—229 **13 Claims**

1. A device for measuring a urine discharge, comprising: a hollow receptacle having an inlet port adjacent an upper end of the receptacle and channel means below the inlet port to receive the liquid passing through the inlet port, a paddle assembly rotatably mounted on the receptacle and having rotatable blade means located in the path of said discharge, and means responsive to the rate of rotation of the paddle assembly

for measuring the velocity of said discharge passing from the port to the channel means, including means for measuring and



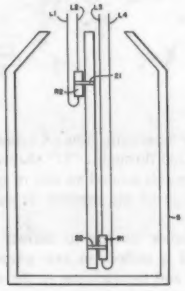
recording the maximum velocity of said discharge passing from the port to the channel means.

4,187,723

LIQUID NITROGEN LEVEL INDICATOR

Stephen P. Golden, Huntsville, and Charles T. Jennings, New Market, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 16, 1978, Ser. No. 951,925
Int. Cl.[2] G01F *23/22*
U.S. Cl. 73—295 **1 Claim**



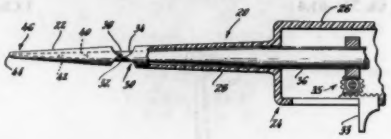
1. A system for indicating the presence or absence of a fluid in a given area comprising a first variable resistance means located at said area; said resistance means changing its resistance in accordance to the presence or absence of said fluid; first circuit means connected to said variable resistance means so as to determine its resistance, and therefore, whether the fluid is present or absent; said first circuit means comprising a first constant current generator connected to said first variable resistance means so as to cause a constant current to flow through said variable resistance means; a first comparator means connected to sense the voltage across said variable resistance means; first indicator means connected to the output of said comparator means so as to indicate the presence or absence of said fluid; a second variable resistance means located in a second area; a second circuit means identical to said first circuit means connected to said second variable resistance means so as to indicate the presence or absence of fluid at said second area; said first and second areas being located in a container that holds said fluid; said first area being located at an upper end of said container; said second area being located at a lower end of said container; a wood rod; two heat shrinkable tubings attaching said first and second variable resistance means to said wood rod; and said wood rod being located inside said container so as to position said resistance means in their respective areas in the container.

4,187,724

REPLACEABLE TIP FOR A PIPETTE

Paul S. Citrin, Danbury, Conn., assignor to Indicon Inc., Brookfield Center, Conn.

Continuation of Ser. No. 868,686, Jan. 11, 1978, abandoned. This application Oct. 4, 1978, Ser. No. 948,486
Int. Cl.[2] B01L *3/02*
U.S. Cl. 73—425.4 P **8 Claims**



1. A replaceable tip for use on the working end of a pipette used to take up and discharge liquid comprising

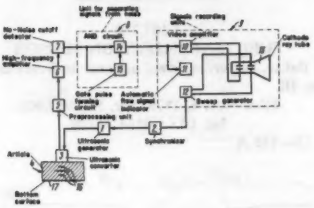
a longitudinal hollow tip body having a liquid flow port through which liquid is to be moved for intake and discharge, said hollow tip body having a pipette receiving end sized to fit over the working end of a pipette, said hollow tip body terminating at said pipette receiving end with a cam surface which is inclined relative to the longitudinal hollow tip body, said cam surface being further inclined to produce a rotational twist of the tip when the working end of a pipette is inserted into the pipette receiving end of the tip.

4,187,725

METHOD FOR ULTRASONIC INSPECTION OF MATERIALS AND DEVICE FOR EFFECTING SAME

Valery S. Gavrev; Jury M. Goncharuk; Sergei B. Birjukov; Alexandr V. Savitsky, and Ljudmila A. Popova, all of Kishinev, U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky Institut Po Razrabotke Nerazrushajuschikh Metodov I Sredsv Kon-trolya Kachestva Materialov, Kishinev, U.S.S.R.

Filed Jul. 6, 1978, Ser. No. 922,585
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—613 **5 Claims**



1. A method for ultrasonic inspection of materials, comprising the steps of

transmitting ultrasonic vibrations into a material being tested;

receiving and processing reflected ultrasonic vibrations;

separating signals from noise at a preset level by means of time selection of these signals, performed within time intervals during which the amplitudes of said signals exceed said preset noise level;

using said signals to evaluate the dimensions of flaws.

4,187,726

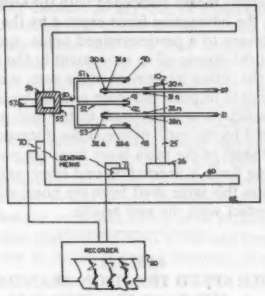
COMPUTER PERFORMANCE MEASUREMENT DEVICE AND PROCESS

Edward A. Olmstead, Federal Way, Wash., assignor to Black Bocs, Ltd., Federal Way, Wash.

Continuation-in-part of Ser. No. 662,013, Feb. 27, 1976, Pat. No. 4,068,302. This application Jan. 9, 1978, Ser. No. 868,036

Int. Cl.[2] G01N *29/00*

U.S. Cl. 73—660 **33 Claims**



27. A method of obtaining data about the performance of a disc information storage device of a computer, said storage device having discs accessed by read-write heads on moveable combs, comprising

detecting the vibrational reaction to the movement of said comb, and

determining from the beginning of said vibrational reaction to comb acceleration the discrete moves of said comb.

4,187,727

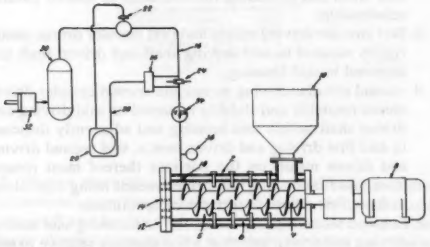
FOOD EXTRUDER PRESSURE INDICATOR

Amir A. Bhimji, Park Forest South, Ill., assignor to General Foods Corporation, White Plains, N.Y.

Filed Sep. 19, 1978, Ser. No. 943,843

Int. Cl.[2] G01L *7/00*

U.S. Cl. 73—706 **1 Claim**



1. A pressure sensing device for continuously measuring the pressure within the barrel of a food extruder operating under pressure which comprises:

(a) a source of pressurized fluid;

(b) a conduit connecting said source of pressurized fluid with the interior of the extruder barrel;

(c) means operatively engaged with said conduit for measuring the flow of fluid therethrough;

(d) means responsive to the measured flow rate for controlling the flow of fluid through the conduit to maintain a positive flow within a predetermined fixed range;

(e) pressure sensing means operatively engaged with said conduit for sensing the pressure within the conduit at a location between the means for measuring flow of fluid and the food extruder, said pressure sensing means being calibrated to indicate the internal extruder pressure; and

(f) a check valve in the conduit between the means operatively engaged with said conduit for measuring the flow and the extruder to prevent the possibility that a sudden surge in pressure in the extruder would cause a backflow of material into the pressure sensing means.

4,187,728

UNIDIRECTIONAL DRIVE SYSTEMS

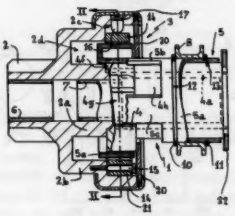
Alfred Mazzorana, Venissieux, France, assignor to Societe de Paris et du Rhone, Lyon, France

Filed Jan. 25, 1978, Ser. No. 872,207

Claims priority, application France, Jan. 31, 1977, 77 03091

Int. Cl.[2] F02N *15/06*; F16D *41/12, 43/20*

U.S. Cl. 74—6 **11 Claims**



1. A drive pinion assembly for a starter having an electric motor comprising a ratchet wheel adapted to be driven by the starter motor, a cage round the ratchet wheel, a drive pinion connected to the cage for rotation therewith, at least one pivotted pawl on the cage which can move into a first position in engagement with the ratchet wheel under the influence of biassing means, and into a second position out of engagement with the ratchet wheel under the influence of centrifugal force caused by rotation of the cage, and a movable stop device which, when the pawl is in its second position, can be so located as to prevent the pawl from engaging with the ratchet wheel.

4,187,729

PUSHBUTTON TUNER

Takao Kanai, and Yashuhisa Nishikawa, both of Toda, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Dec. 12, 1977, Ser. No. 859,668

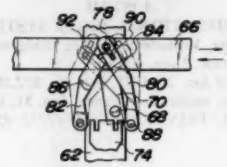
Claims priority, application Japan, Dec. 16, 1976, 51/150293; Dec. 17, 1976, 51/168173; Dec. 28, 1976, 51/175143; Dec. 28, 1976, 51/175144

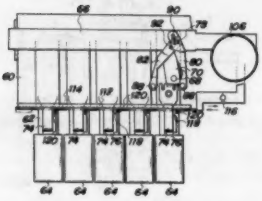
Int. Cl.[2] F16H *35/18*

U.S. Cl. 74—10.9 **12 Claims**

1. In a pushbutton tuner including support means, a plurality of operative means each having a pushbutton connected thereto and positioned on said support means with the associated operative means for similar movement from an inoperative position to an operative position upon depression of the pushbutton, and first tuning means positioned on said support means for movement in a direction transverse to the direction of movement of the operative means, the improvement comprising: linkage means responsive to the depression of any selected one of said pushbuttons for moving said tuning means in said transverse direction a distance which varies with the particular pushbutton which is depressed, said linkage means comprising a pair of somewhat L-shaped links associated with each operative means, each pair of links being supported for pivotal movement about parallel pivot axes spaced apart in a direction parallel to said transverse direction, the free end portions of each pair of links overlapping one another and each having elongated slots receiving a projection extending from said tuning means so that as each pair of links assumes different

relative angular positions with respect to the associated pivot points the tuning means has a different corresponding position, and there is associated with each of said operative means adjustable tuning control means for engaging at least one of the confronting edges of the associated pair of links when the associated pushbutton is fully depressed, each of said adjustable control means being lockably adjustable in position in a direction parallel to said transverse direction of movement of





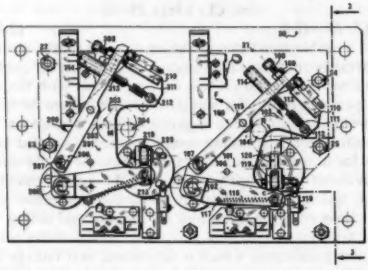
said tuning means and so that upon full depression of the associated pushbutton the tuning control means will first engage at least one confronting link edge to pivot the associated links when the pushbutton is partially depressed and upon further depression of the associated pushbutton will slide along the latter edge until it reaches the point of intersection between said confronting edges where further pivotal movement of the links is terminated.

4,187,730

LEVER CONTROL ARRANGEMENT FOR CONTROLLING THE MOVEMENT OF AN OSCILLATING LEVER

M. Raymond Delorme, Bagnolet, France, assignor to Compagnie Internationale pour l'Informatique, Paris, France

Filed Jun. 17, 1977, Ser. No. 807,742
Claims priority, application France, Jul. 7, 1976, 76 20785
Int. Cl.[2] F16H *25/08*
U.S. Cl. 74—54 **10 Claims**



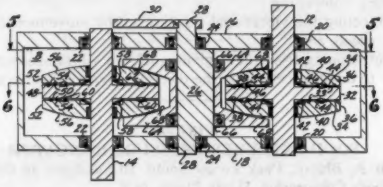
1. In a lever control arrangement for controlling the alternate reciprocating movement of a main lever pivotally mounted ona first shaft from a drive means including a motor having a rotatable shaft adapted to be rotatably driven upon energization of the motor, a cam attached to said rotatable shaft and a transmission mechanism disposed between said cam and said main lever and operably connecting said cam to the main lever for relaying the movement of the cam to the said main lever without any direct contact between the cam and the said main lever, comprising a first auxiliary lever, pivotally mounted to a second shaft arranged parallel to the first shaft of the main lever, said auxiliary lever being in contact with said cam, spring means connecting the two levers and urging the main lever in a first direction of said alternate movement, means limiting the displacement of said main lever to a defined value in the direction in which it is urged by the said spring means, and setting means associated with the said spring means for adjusting the interacting force exerted by the spring means on the two levers to a predetermined value, such that, if the main lever in the course of its movement in the first direction arising from the rotary movement of the cam, is arrested by an article arranged in its path, the force exerted by the main lever on the said article is at least equal to the said predetermined value multipled by the ratio between the distance which separates the first shaft of the main lever from the point where the said interacting force is exerted on said lever, and the distance which separates this same shaft from the point where the main lever is in contact with the said article.

4,187,731

VARIABLE SPEED TRACTION TRANSMISSION

Robert G. James, 3509 Janene Way, Bakersfield, Calif. 93306

Filed Aug. 15, 1977, Ser. No. 824,345
Int. Cl.[2] F16H *15/26, 15/08, 55/34, 15/00*
U.S. Cl. 74—198 **9 Claims**



1. A variable speed traction transmission that includes:
a. a housing that includes a pair of side walls;
b. a driving shaft and a driven shaft journalled in said pair of side walls and extending therebetween in spaced parallel relationship;
c. first circular driving means and first circular driven means rigidly secured to said driving shaft and driven shaft and disposed in said housing;
d. second circular driving means and second circular driven means rotatably and slidably mounted on said driving and driven shaft within said housing and adjacently disposed to said first driving and driven means, said second driving and driven means on the portions thereof most remote from said first driving and driven means being convolved to form first elliptical surfaces of revolution;
e. first and second spring means for maintaining said second driving and driven means at a first distance relative to said first driving and driven means where said first driving and driven means may rotate without rotating said second driving and driven means;
f. first and second means operatively associated with said first and second driving means and said first and second driven means for concurrently rotating said first and second driving means and said first and second driven means when said first distance is lessened to a second distance and said driving shaft is rotated;
g. a third shaft journalled in said side walls and extending therebetween, said third shaft intermediately disposed between said first and second shafts, said third shaft laterally movable relative to said driving and driven shafts;
h. a circular power transmitting element rotatably supported on said third shaft, said element defining a ring-shape

having a peripheral groove convolved on the inwardly opposing faces thereof to form second elliptical surfaces of revolution; and

i. third means for moving said third shaft and power transmitting element laterally relative to said driving and driven shafts, said third means when disposing said third shaft and power transmitting element in a first position allowing said driving shaft and first driving means to rotate without driving said second driving means, but said third means when disposing said third shaft and power transmitting element in any one of a plurality of second positions moving said second driving means towards said first driving means due to a first section of said ring-shaped surface forcibly and frictionally contacting said first elliptic surface of said second driving means to lessen said first distance to said second distance and said first and second driving means rotating said power transmitting element, and a second section of said ring-shaped surface forcefully and frictionally contacting said first elliptic surface of said second driven element to move said second driven element to said second distance relative to said first driven element, with said driven shaft rotating at a different rate than said driving shaft when said first and second sections are at different radial distances from said third shaft.

4,187,732

SHEAVE ASSEMBLY FOR V-BELT TYPE INFINITELY VARIABLE TRANSMISSIONS

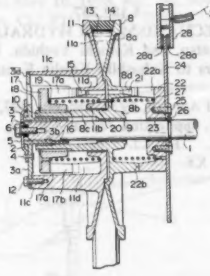
Izumi Takagi, and Shigeo Adachi, both of Akashi, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Nov. 7, 1977, Ser. No. 849,219

Claims priority, application Japan, Nov. 12, 1976, 51/152439[U]

Int. Cl.[2] F16H *55/52*

U.S. Cl. 74—230.17 M **3 Claims**



1. Sheave assembly for a V-belt type infinitely variable transmission comprising a shaft, a fixed sheave element secured to the shaft and having a frustoconical side surface, a movable sheave element mounted on said shaft for axial movement along the shaft, said movable sheave element having a frustoconical side surface located in opposed relationship with respect to the frustoconical side surface on the fixed sheave element to define a circumferential groove of substantially V-shaped cross-section between said side surfaces on the sheave elements for engagement with a V-belt of the transmission, means for resiliently biasing said movable sheave element toward said fixed sheave element, cam means provided between said movable sheave element and a member rotatably mounted on said shaft, means provided for applying retarding force to said rotatable member so as to produce a relative displacement between said movable sheave element and said member, said cam means being responsive to said relative displacement to produce a cam force which urges said movable sheave element toward said fixed sheave element.

4,187,733

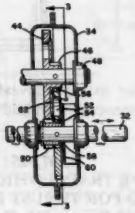
SPEED REDUCTION MECHANISM FOR SEMI-TRAILER LANDING GEAR

William D. Walther, Kettering, and Charles E. Phillips, Bryan, both of Ohio, assignors to Dayton-Walther Corporation, Dayton, Ohio

Filed May 30, 1978, Ser. No. 910,832

Int. Cl.[2] F16H *3/22*; B60S *9/04*

U.S. Cl. 74—342 **5 Claims**



1. In a geared speed reduction crank mechanism for a semi-trailer landing gear, the improvement comprising:

a support housing;

a pair of parallel vertically spaced horizontally disposed shafts mounted for rotation in said housing, one of said shafts having an end portion extending outwardly from said housing and the other of said shafts engaging means for raising and lowering said landing gear;

crank means secured to said end portion of said one shaft for causing rotation thereof;

first and second gears secured to said other of said shafts;

a third gear secured to said one of said shafts and engageable with said first gear;

a fourth gear having internal and external gear teeth and mounted for independent rotation on said one of said shafts, said external teeth being engageable with said second gear and said internal teeth being engageable with said third gear;

means maintaining said fourth gear in substantially laterally fixed position; and

said one shaft being axially movable between a position in which said third gear is in driving engagement with said first gear while said fourth gear is free to rotate and a position in which said third gear drivingly engages said fourth gear and said fourth gear drivingly engages said second gear.

4,187,734

ELECTRIC REGULATING DEVICE

Arnold Mann, Bieber, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 15, 1977, Ser. No. 860,678

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 2658093; Sep. 15, 1977, 2741475

Int. Cl.[2] F16H *57/00*

U.S. Cl. 74—405 **11 Claims**

1. An electrical regulating device, particularly for a speed control device for motor vehicles, comprising

a regulating member,

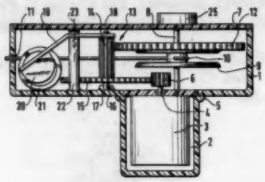
means for actuating said regulating member, said means constituting a rotatably mounted element, said element is formed as a cable pulley,

a servomotor,

a coupleable mechanical gearing means and a coupling means therefor including an electromagnet for operatively connecting said cable pulley with said servomotor,

an armature cooperating with said electromagnet, and

said gearing means includes a plurality of gears, at least one of said gears of said gearing means being substantially



radially and/or axially moveably mounted and being operatively connected with said armature.

4,187,735

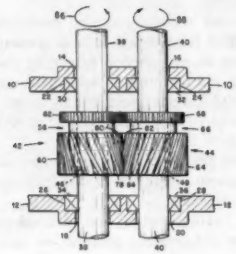
HELICAL DRIVE TRAINS WHICH ELIMINATE THE NEED FOR THRUST BEARINGS

Clegia L. Terry, 2116 Carving Rd., Knoxville, Tenn. 37912

Filed Aug. 7, 1978, Ser. No. 931,555

Int. Cl.² F16H *57/00*

U.S. Cl. 74—410 **8 Claims**



1. A helical gear, spur gear drive combination for controlling end thrust comprising;

a first support shaft;

a first combination including a first helical toothed gear securely attached to a first straight toothed gear, said first helical toothed gear and said first straight toothed gear having a common pitch diameter and a common axis of rotation, said first combination being mounted on said support shaft such that rotation of said shaft results in rotation of said first combination and such that rotation of said first combination results in rotation of said first shaft;

a second combination including a second helical toothed gear and a second straight toothed gear securely attached to each other, said second helical toothed gear and said second straight toothed gear having a common pitch diameter and a common axis of rotation, the teeth of said second helical gear having a pitch angle equal to and opposite that of the teeth of said first helical gear, and a tooth size and spacing such that teeth of said first and second helical gears may properly mesh, the teeth of said second straight toothed gear having a tooth size and spacing such that they may properly mesh with the teeth of said first straight toothed gear; and

a second support shaft on which is mounted said second combination such that rotation of said second shaft results in rotation of said second combination and such that rotation of said second combination results in rotation of said second shaft, said second support shaft being located parallel and adjacent to said first support shaft such that the helical gear teeth and the straight toothed gear teeth of said first combination are in a meshing relationship with the helical gear teeth and the straight toothed gear teeth of said second combination, respectively.

4,187,736

RACK STEERING

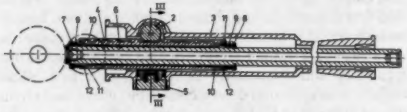
Gerhard Haegele, Hohenstadt, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Aug. 10, 1978, Ser. No. 932,640

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1977, 2736631

Int. Cl.² B62D *1/20*

U.S. Cl. 74—422 **10 Claims**



1. In a gear rack steering device comprising a steering shaft having a pinion and a gear rack engaged thereby, the improvement which comprises a guide bar with said gear rack being slidably carried thereon;

shock cushioning means carried by said guide bar and secured thereto and engaging respective ends of said gear rack;

said guide bar being adapted for connection to a steering linkage mechanism and reciprocated through said cushioning means by said gear rack to effect steering by operation of said steering shaft;

wherein road shock transmitted from a steering linkage mechanism to said guide bar is absorbed by said cushioning devices.

4,187,737

CONTROL MECHANISM FOR HYDRAULIC SYSTEM

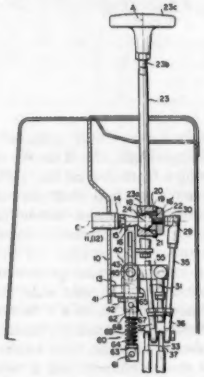
Ikuo Mori, Komatsu, and Kenichi Yoshida, Kanazu, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Apr. 19, 1978, Ser. No. 897,676

Claims priority, application Japan, Apr. 19, 1977, 52-44151

Int. Cl.² G05G *9/04*

U.S. Cl. 74—471 XY **4 Claims**



1. A control mechanism for hydraulic system comprising a frame, a stud member fixedly secured to said frame, said stud member having a ball formed at one end thereof, a socket means mounted on the ball of said stud member encircling

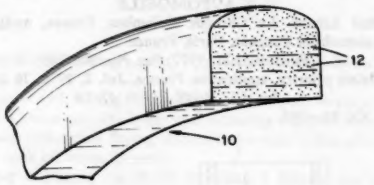
thereof, said socket means being adapted to pivot in every direction relative to the ball, a control lever fixedly secured to said socket means, said control lever having a straight portion and an extension reference line of the axis thereof passing through the center of the ball of said stud member, first and third ball coupling means fixedly secured to said socket means, said first and third ball coupling means being arranged in such a manner that the centers thereof are located on a first crossing reference line passing through the center of the ball of said stud member and at right angles to the extension reference line, second ball coupling means fixedly secured to said socket means, said second ball coupling means being arranged in such a manner that the center thereof is located on a second crossing reference line passing through the center of the ball of said stud member and at right angles to the extension reference line and also the first crossing reference line, first and second connecting rods, each being connected to said first and second ball coupling means, respectively, at upper ends thereof, the lower ends of which being connected to first and second control valves, respectively, a third connecting rod connected at its lower end to a third control valve, and motion translation connecting means interconnecting said third ball coupling means and said third connecting rod for translating a rotational motion of said third ball coupling means into a linear motion of said third connecting rod.

4,187,738

RIM FOR ROTARY INERTIAL ENERGY STORAGE DEVICE AND METHOD

Charles E. Knight, Jr., Knoxville, and Roy E. Pollard, Powell, both of Tenn., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed May 10, 1978, Ser. No. 904,676
Int. Cl.[2] F16F *15/30;* F16C *15/00*
U.S. Cl. 74—572 **5 Claims**



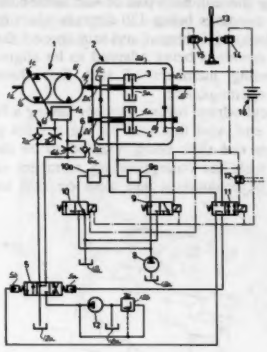
1. An improved rim for a rotary inertial energy storage device, said rim comprising a plurality of concentrically disposed and abutting layers of filamentary material in a resin matrix with said resin bonding together adjacent layers of filamentary material, said layers being characterized by being discretely and sequentially formed by winding a resin impregnated filamentary material in a circumferential side-by-side pattern with the resin impregnant being cured prior to the application of each succeeding layer and with the filamentary material in each layer extending from the radially innermost layer to the radially outermost layer being applied with a greater and sufficient winding tension to provide a different residual stress within each of the wound layers adequate for counterbalancing the radial stresses generated during the rotation of the rim throughout the entire radial thickness of the multilayers and thereby providing sufficient stretching of the filamentary material in each of the layers to inhibit deleterious delamination during rotation.

4,187,739

HYDROSTATIC TORQUE CONVERTER HAVING A STEPPED TRANSMISSION

Karlmann Hamma; Anton Ott, both of Tettnang; Werner Vetter, and Arun Chatterjee, both of Friedrichshafen, all of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Dec. 13, 1977, Ser. No. 860,162
Int. Cl.[2] F16H *47/00*
U.S. Cl. 74—732 **7 Claims**



1. A hydrostatic torque converter comprising:
an input shaft and an output shaft;
a hydrostatic transmission including a variable displacement pump connected to and driven by said input shaft and a hydrostatic motor hydraulically connected to said pump, said pump having a control element for varying the displacement per revolution thereof;
a stepped gear transmission shiftable under load connected between said motor and said output shaft, said gear transmission having at least two selectively engageable and disengageable clutches establishing respective transmission ratios of the gear transmission;
selector means including control valves for selectively feeding fluid to said clutches and discharging fluid from said clutches for the engagement and disengagement thereof to select one of said transmission ratios;
a switch valve connected with said hydrostatic transmission for controlling the displacement of said element;
means for applying the fluid pressure at said clutches to said switch valve for controlling same in response to selection of a transmission ratio to adjust said hydrostatic transmission for speed compensation upon switchover between said transmission ratios; and
pressure modulation valves in fluid connection with said clutches for modifying the rate of engagement thereof such that the adjustment of the hydrostatic transmission for speed compensation is effected outside the period wherein the clutch to be disengaged is still in an engaged condition and the clutch to be engaged has been subjected to incipient loading.

4,187,740

EPICYCLIC GEAR TRAIN PLANET CARRIER SYSTEM

Giovanni J. Silvestri, 4 Meadowbrook Dr., Barrington, R.I. 02806

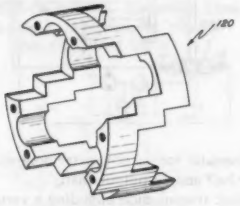
Filed May 18, 1977, Ser. No. 798,066
Int. Cl.[2] F16H *1/28, 3/44*
U.S. Cl. 74—750 R **5 Claims**

1. A planet carrier system in an epicyclic gear train assembly including two planet sets, each of the two planet sets having three planet clusters, which comprises:
an input planet carrier bearing plate for supporting one end of the first gear of each of said planet clusters, said input

planet carrier bearing plate having a first plurality of projections and slots and further having a first three pairs of threaded openings adjacent outer edge thereof, each pair of said first three pairs of threaded openings being 120 degrees apart from the remaining two pairs thereof;

an output planet carrier bearing plate for supporting the opposite end of the first gear of each of said planet clusters, said output planet carrier bearing plate having a second plurality of projections and slots and further having a second three pairs of threaded openings adjacent outer edge thereof, each pair of said second three pairs of threaded openings being 120 degrees apart from the remaining two pairs thereof and said second three pairs of threaded openings being adapted to be aligned with the corresponding members of said first three pairs of threaded openings; and

a generally cylindrical bridge member having a first end and a second end, said first end having a third plurality of projections and slots being adapted to be demountably engaged with the corresponding members of said first plurality of projections and slots on said input planet



carrier bearing plate and said second end having a fourth plurality of projections and slots being adapted to be demountably engaged with the corresponding members of said second plurality of projections and slots on said output planet carrier bearing plate, said bridge member further having a third three pairs of counterbored threaded openings on the first end thereof and a fourth three pairs of counterbored threaded openings at the second end thereof, each pair of said third plurality of counterbored threaded openings being 120 degrees apart from the remaining two pairs thereof and each pair of said fourth plurality of counterbored threaded openings being 120 degrees apart from the remaining two pairs thereof, and said first and second three pairs of threaded openings respectively on said input planet carrier bearing plate and on said output planet carrier bearing plate and said third and fourth three pairs of threaded openings respectively on the first end and second end of said bridge member being adapted to be aligned and mutually engaged for accurate positioning so as to form the planet carrier system.

4,187,741

POWER REGENERATIVE TRANSMISSION

Bengt E. Nyman, 5514 S. Crow's Nest Rd., Tempe, Ariz. 85283

Filed Jan. 3, 1977, Ser. No. 756,255
Int. Cl.[2] F16H *3/74*; B60K *9/00*
U.S. Cl. 74—751 **18 Claims**

1. A power regenerative transmission system for augmenting the power generated by the prime mover of a vehicle during acceleration of the vehicle drive shaft and recovering the kinetic energy of the vehicle during decelaration, said system comprising in combination:

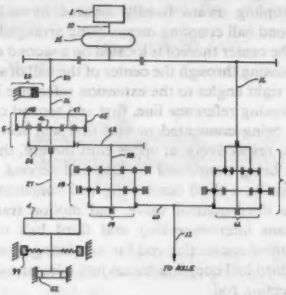
a. a transmission disposed intermediate the prime mover and the drive shaft for transmitting power therebetween;

b. flywheel means for receiving, storing and transmitting energy;

c. torque sensitive gearing means for preempting the power flow through said transmission during acceleration and deceleration of the drive shaft in response to the torque sensed, said torque sensitive gearing means including torque responsive means comprising:

i. a first leg in rotational communication with the prime mover for transmitting and sensing the torque present at the output shaft of the prime mover;

ii. a second leg in rotational communication with the drive shaft for transmitting and sensing torque to and from the drive shaft; and



iii. a third leg in rotational communication with said flywheel means for transferring energy into and out of said flywheel means in response to power transfer between said first and second legs;

d. brake means disposed intermediate said first leg and the output shaft of the prime mover for braking said first leg;

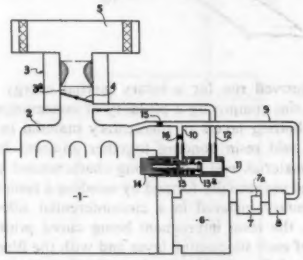
whereby, the energy stored within said flywheel means is transferred to the drive shaft during acceleration to augment the power generated by the prime mover and the kinetic energy of the vehicle is recovered by said flywheel means during deceleration of the vehicle.

4,187,742

CONTROL OF AN AUTOMATIC GEARBOX IN AN AUTOMOBILE

Michel Achard, La Garenne Colombes, France, assignor to Automobiles Peugeot, Paris, France

Filed Jun. 21, 1977, Ser. No. 808,518
Claims priority, application France, Jul. 2, 1976, 76 20275
Int. Cl.[2] B60K *23/00, 41/18*
U.S. Cl. 74—863 **4 Claims**



1. In a device combined with an automatic gearbox and an engine having an inlet pipe and a throttle valve in the inlet pipe for moving between an idling engine speed position and a full engine speed position, which device is for controlling the gearbox and comprises means defining a vacuum-responsive engine load correcting first valve which is adapted to vary engine loads at which speeds of the gearbox are automatically

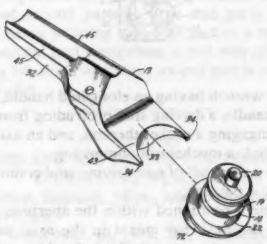
changed depending on the position of said valve, first passage means putting said valve in communication with the inlet pipe; the improvement comprising venting means for putting said first valve in communication with the atmosphere, the venting means comprising second passage means connected to the first passage means at a given connection and communicating with the atmosphere when the throttle valve is moved away from said idling engine speed position, a second valve inserted in the second passage means and responsive to the temperature of the engine for opening the second passage means when the engine is cold and closing the second passage means when the engine is warm, means for closing said second passage means off from the atmosphere when the throttle valve is in said idling engine speed position, calibrated restrictors respectively inserted in the first passage means between said given connection and the inlet pipe and in the second passage means between said given connection and the second valve, the first passage means being connected to the inlet pipe in a position to always communicate with the inlet pipe on the downstream side of the throttle valve relative to the fluid flow through the inlet pipe.

4,187,743

ROCK BIT AND METHOD OF MANUFACTURE

Robert D. Thomas, Tonkawa, Okla., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Apr. 21, 1978, Ser. No. 898,913
Int. Cl.[2] E21B *9/08*
U.S. Cl. 76—108 A **10 Claims**



1. A method of making a rotary rock bit comprising the steps of:

forming a rock bit leg segment having an upper shank end and a lower end, the lower end including a socket having a semi-cylindrical faying surface transverse to the axis of the rock bit being formed;

forming a journal pin insert including a journal pin for mounting a rock bit cutter cone, a shirttail transverse to the journal pin, and a semi-cylindrical faying surface on the shirttail portion coaxial with the journal pin;

fitting the journal pin insert to the rock bit leg segment with the semi-cylindrical faying surface of the journal pin insert mated with the semi-cylindrical faying surface of the socket; and

electron beam welding the semi-cylindrical faying surfaces.

4,187,744

APPARATUS FOR ROTATING TRACK CHAIN BUSHING

Richard E. Livesay, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 19, 1978, Ser. No. 916,974
Int. Cl.[2] B25B *19/00*
U.S. Cl. 81—3 R **4 Claims**

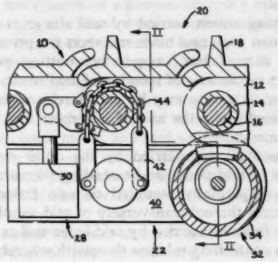
1. An apparatus for controllably rotating a track chain bushing (14) relative to a pair of track chain links (12) connected to opposed ends of the bushing (14), comprising:

a clamp (24) having a construction sufficient for circumferentially engaging the bushing (14) with a force sufficient for preventing relative motion between the clamp (24) and bushing (14);

a hydraulic cylinder (30) connected to the clamp (24) and movable between a retracted position and an extended position;

first means (28) for extending the cylinder (30) and applying a turning force to the clamp (24) and torquing the bushing (14) a preselected amount in a first direction;

second means (32) for successively impacting a selected one of the pair of links (12) a number of times sufficient for rotating the bushing (14) a preselected amount relative to



the selected link (12) and alternatively, successively impacting the other one of the pair of links (12) a number of times sufficient for rotating the bushing (14) a preselected amount relative to said other link (12) said second means (32) including an eccentric crankshaft motor (34) having first and second impactors (36,38) of a size sufficient for impacting a selected area of an associated link (12); and

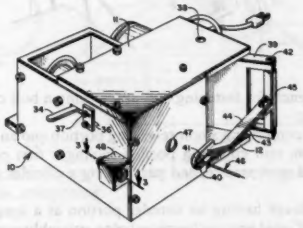
a support chain (42) entrained about the bushing (14) and connected at its end points to the motor (34), said chain (42) maintaining the impactors (36,38) at locations sufficient for impacting the links (12).

4,187,745

WIRE STRIPPER

Roger T. Lambert, Fridley, Minn., assignor to Omnetics, Inc., Minneapolis, Minn.

Filed May 8, 1978, Ser. No. 903,858
Int. Cl.[2] H02G *1/12*
U.S. Cl. 81—9.51 **29 Claims**



1. A wire stripper comprising,

(a) a frame;

(b) a rotor mounted on said frame for rotation about its longitudinal axis;

(c) a motor mounted on said frame and connected to said rotor in rotary driving relation;

(d) a pair of blade members each pivotally mounted upon one end of said rotor for pivotal movement toward each other into cooperative cutting position at opposite sides of the axis of rotation of said rotor and away from each other to retracted non-cutting position;

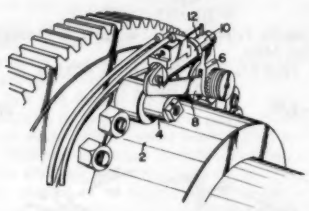
(e) the axis of pivot of each of said blade members extending parallel to the axis of rotation of said rotor and being located at opposite sides thereof;
(f) each of said blade members being flat and generally semi-circular in shape and having a generally diametrically extending edge and having its axis of pivot adjacent its periphery and its said diametrically extending edge;
(g) a cutting edge formed on each of said blade members along its said diametrically extending edge opposite the axis of rotation of said rotor;
(h) a sleeve telescopically carried by said rotor and rotating therewith and being controllably shiftable longitudinally thereof;
(i) camming means carried by said sleeve in camming engagement with said blade members for pivoting the same when desired into cooperative cutting positions with respect to the axis of rotation of said rotor, whereby the coating on a wire may be cut thereby when the wire is positioned along the axis of said rotor and between said blade members;
(j) an annular way carried by the outer circumferential surface of said sleeve and extending therearound;
(k) a lever pivotally mounted on said frame for pivotal movement thereof transversely of said annular way, and
(l) a way follower carried by said lever and extendinto said way in controlling relation therewith whereby said sleeve and said way and said camming means may be shifted longitudinally of said rotor by pivoting said lever to cam said blade members into said cutting position as and when desired.

4,187,746

POWER WRENCH HAVING RATCHET MEANS AT BOTH SURFACES OF SOCKET THEREOF

Tsugio Shibata, 7-2-1, Nagazumi, Minami-ku, Fukuoka-shi, Fukuoka, Japan

Filed Feb. 10, 1978, Ser. No. 876,603
Int. Cl.[2] B25B *13/26*
U.S. Cl. 81—57.39 **10 Claims**



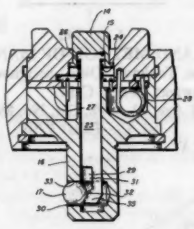
1. A wrench for fastening and unfastening a bolt or the like comprising:
a socket comprising a bolt receiving portion and an engaging portion, said engaging portion having a first part and a second part, said second part having a circular cross-section;
a drive lever having an annular portion at a torquing end thereof, said annular portion being rotatably mounted on said circular cross-section of said second part and having right-hand radial teeth and left-hand radial teeth formed on opposed and axially spaced faces of said annular portion;
a ratchet cap nonrotatably received on said first part of said engaging portion of said socket, said ratchet cap having ratchet teeth formed on a face thereof;
a biasing means detachably mounted on said socket for biasingly meshing said ratchet teeth of said ratchet cap with said right-hand radial teeth;
said drive lever being oscillateable to thereby intermittently rotate said socket in a right-hand direction through said right-hand radial teeth on said drive lever and said ratchet teeth on said ratchet cap to thereby tighten said bolt;
said ratchet cap being removable from said socket to thereby allow said drive lever to be removed from the socket and turned 180 degrees to be replaced on the socket such that said left-hand radial teeth on said drive lever are engageable with ratchet teeth on another ratchet cap placed on said second part of said engaging portion of said socket, whereby oscillation of said drive lever intermittently rotates said socket in a left-hand direction through said left-hand radial teeth on said drive lever and said ratchet teeth on said other ratchet cap to thereby loosen said bolt.

4,187,747

QUICK RELEASE MECHANISM FOR SOCKET WRENCH

Roy E. Pawlow, Middletown, Conn., assignor to Litton Industrial Products, Inc., New Britian, Conn.

Filed Feb. 21, 1978, Ser. No. 879,798
Int. Cl.[2] B25B *13/00*
U.S. Cl. 81—177 G **3 Claims**



1. In a socket wrench having an elongated handle, a head on one end of the handle, a driving stud protruding from the head for driving by engaging a socket thereon, and an axial passage in the driving stud, a mechanism comprising:
an aperture in a side wall of said driving stud communicating with the axial passage,
a spherical detent positioned within the aperture,
an elongated flat push bar means in the axial passage for urging the detent to protrude from the side wall through the aperture, the flat push bar means having a thickness which is substantially less than the diameter of the spherical detent,
a notch in one end of the flat push bar means, the notch comprising a constant depth portion and a sloped portion wherein the sloped portion is effective at one end thereof to urge the detent to protrude from the aperture and at the other end to allow the detent to retract into the aperture,
resilient means for biasing said push bar means, and
two surface means in the sloped portion of the notch, the two surface means contacting the spherical detent at spaced points to provide a positive seating surface for the detent, to urge the detent to protrude from the aperture, and to prevent the push bar means from rotating within the driving stud.

4,187,748

AUTOMATIC MACHINE TOOL

Richard F. Evans, 36 School La., Solihull, West Midlands, England

Filed Aug. 8, 1977, Ser. No. 822,655
Claims priority, application United Kingdom, Aug. 6, 1976, 32780/76
Int. Cl.[2] B23B *3/04, 13/12*
U.S. Cl. 82—2.5 **26 Claims**

1. An automatic machine tool of the kind comprising at least one rotatable main collet adapted to hold non-round bar stock during turning or other machining operations, and a respective feed tube axially aligned with each main collet and through

which non-round bar stock is arranged to be fed automatically to the main collet by a respective feed collet associated with each feed tube, each feed collet being carried adjacent to the end of the respective feed tube remote from the respective main collet, each feed collet is provided with at least one wedging element associated with a respective wedge surface of the feed collet, the arrangement being such that each feed collet is movable under non-round bar stock in the direction away from the respective main collet but on movement of the feed collet in the opposite direction each wedging element is wedged between the bar and the respective wedge surface to grip the bar, and means permanently keying each feed tube against angular movement relative to the respective main collet.

17. An automatic machine tool of the kind comprising at least one rotatable main collet for holding bar stock during a machining operation, and a respective feed tube axially aligned with each main collet, a respective feed collet associated with each feed tube, a stop, a feed station, means for moving said stop axially towards a main collet located at said feed station, said feed collet having first and second parts which are axially movable relative to each other, the second part of each feed collet being spaced further from the respective main collet than is the respective first part, resilient means acting between said first and second parts to urge said parts towards each other, and means securing said first part to a respective feed tube, said second part comprising a one way gripping device for gripping bar stock when said second part is moved towards said main collet.

4,187,749

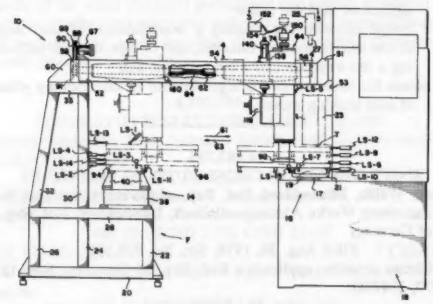
METHOD AND APPARATUS FOR LOADING AND UNLOADING WORKPIECES

Robert Webber, Saginaw, Mich., assignor to Bay City Boring, Bay City, Mich.

Filed Mar. 13, 1978, Ser. No. 885,497

Int. Cl.[2] B23B *13/00*; B25J *3/00*

U.S. Cl. 82—2.7 **15 Claims**



1. Loading and unloading apparatus for loading and unloading a machine tool comprising:

a frame;

a supply-discharge conveyor for supplying unmachined workpieces to a load-unload station and for receiving machined workpieces from said load-unload station; and

transfer means on said frame for transferring unmachined workpieces from said conveyor to said machine tool and for transferring machined workpieces from said machine tool to said conveyor at said load-unload station;

said transfer means including:

unmachined workpiece chuck means for gripping and holding unmachined workpieces on said conveyor, and removing an unmachined workpieces from said conveyor at said load-unload station to a first retracted position;

means for bodily forwardly transferring said unmachined workpiece chuck means and the unmachined workpiece held thereby from said first retract position to a first advanced position forwardly of said retracted position which is remote from said conveyor and adjacent such a machine tool;

machined workpiece chuck means for gripping and holding machined workpieces on a portion of such a machine tool and removing a machined workpiece from said portion of such a machine tool and transferring it to a second advanced position forward of said first advanced position;

means for interchanging the first and second advanced positions of said machined and unmachined workpiece chuck means adjacent said machine tool so that said unmachined workpiece chuck means and said unmachined workpiece held thereby is in said second advance position and said machined workpiece chuck means and said machined workpiece held thereby is moved to said first advance position;

means for operating said unmachined workpiece chuck means to deposit said unmachined workpiece on said portion of sad machine tool;

means for bodily rearwardly transferring said machined workpiece chuck means to said retracted position; and

means for operating said machined workpiece chuck means to release said machined workpiece for deposit on said conveyor.

4,187,750

MACHINE FOR AUTOMATICALLY CUTTING AN ELONGATE MATERIAL INTO LENGTHS

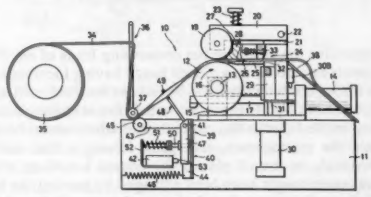
Kenichiro Ito, Monchen-Gladbach, and Kurt Schischkoff, Aschaffenburg, both of Fed. Rep. of Germany, assignors to Yoshida Kogyo K K, Tokyo, Japan

Filed Mar. 20, 1978, Ser. No. 888,374

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1977, 2714169

Int. Cl.[2] A44B *19/42*

U.S. Cl. 83—67 **7 Claims**



1. A machine for automatically cutting an elongate material into lengths, comprising:

(a) a base;

(b) roller means rotatably mounted on said base for feeding the elongate material a predetermined interval at a time;

(c) means on said base having a cycle of operation for rotating said roller means an angular amount corresponding to said predetermined interval;

(d) means on said base for cutting off the elongate material fed by said roller means; and

(e) means for alternately driving said rotating means and said cutting means and for automatically repeating the operation of said rotating means for a preselected number of cycles before actuation of said cutting means;

(f) said roller means including a conveyor roller rotatably

mounted on said base and an idler roller urged against said conveyor roller, the elongate material being transportable by and between said conveyor and idler rollers:

(g) said rotating means comprising a first fluid-pressure actuator having on its piston rod a toothed rack, there being a freewheeling pinion on the shaft of said conveyor roller, and said toothed rack being in mesh with said freewheeling pinion;

(h) said cutting means comprising a second fluid-pressure actuator having on its piston rod a cutter blade which on energization of said second actuator is movable across a passageway through which can pass the elongate material fed by said conveyor and idler rollers; and

(i) said driving and repeating means comprising a first fluid circuit including a first four-way valve for selecting the direction of movement of the piston rod of said first actuator, and a second fluid circuit including a second four-way valve for selecting the direction of movement of the piston rod of said second actuator, there being a pair of first and second limit switches for sensing the forward and rearward stroke ends, respectively, of the piston rod of said first actuator, and a pair of third and fourth limit switches for sensing the forward and rearward stroke ends, respectively, of the piston rod of said second actuator, said first four-way valve being switchable by said first and fourth limit switches, and said second four-way valve being switchable by said second and third limit switches.

4,187,751

LEAD CROPPING APPARATUS

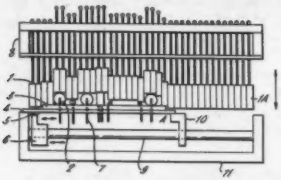
Leslie J. H. Barnacle, Coventry, England, assignor to Cosarnia Limited, St. Peter Port, Channel Islands

Filed Jun. 6, 1978, Ser. No. 913,579

Claims priority, application United Kingdom, Jun. 14, 1977, 24667/77; Mar. 11, 1978, 9723/78

Int. Cl.[2] B23C *1/08*; B26D *7/06*

U.S. Cl. 83—458 **28 Claims**



1. Apparatus for cropping the connecting leads of electrical components assembled on a circuit board having locating holes therein through which the leads have been inserted, said apparatus comprising a plate provided with holes at spacings corresponding to the holes in the circuit board which are to be used to locate the components, said plate having a first surface against which, in use, is placed the circuit board on which electrical components have been arranged by passing the leads thereof through appropriate holes in the circuit board, the leads extending through the holes in the circuit board and also through corresponding holes in the plate; a first structure adapted to support the plate and on which is mounted a cutter means movable in proximity to a second surface of the plate substantially parallel with said first surface to crop the portions of the leads of the components extending through the holes in the plate beyond said second surface by a shearing or cutting action; and a second structure carrying a multiplicity of substantially parallel rods which are movable into engagement with components on a circuit board placed on said plate which is supported on the first structure, the ends of the rods engaging said components to hold the components in position on the circuit board and said rods being individually axially displaceable whereby the rods are displaced relatively to one another according to the size or shape of the different components, said first and second structures being movable relative to one another whereby movement of one of said structures toward or away from the other is effective to move the rods into engagement with the components on the circuit board or to release the rods from the components.

4,187,752

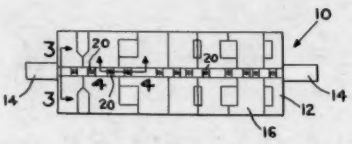
ROTARY DIE LOCK STRUCTURE

W. Richard Chesnut, West Caldwell, N.J., assignor to W. R. Chesnut Engineering, Inc., Fairfield, N.J.

Filed Dec. 15, 1977, Ser. No. 860,691

Int. Cl.[2] B23D *25/12*

U.S. Cl. 83—663 **3 Claims**



1. Die sheet locking structure for die roller assembly comprising:

a die roller having a circumferential surface;

a transverse channel formed in said die roller, said transverse channel having a base surface and a plurality of tapped bores formed in said base surface;

a die sheet disposed around said circumferential surface of said die roller, said die sheet having transversely extending terminal edges, said terminal edges having shoulder means formed thereon, and said die sheet further being provided with at least one land disposed around the circumferential surface thereof;

locking means disposed in said transverse channel, said locking means including at least one locking plate having a shoulder thereon, said shoulder on said locking plate for engaging at least one of said shoulders on said terminal edges of said die sheet;

means for drawing said locking plate toward said base surface of said transverse channel with said at least one shoulder of said locking plate in engagement with said at least one of said shoulders of said die sheet, said drawing of said locking plate for causing stretching of said die sheet into surface-to-surface engagement with said circumferential surface of said die roller;

a bridge element for causing a continuation of said land across said transverse channel, said bridge element including a die member and a land means; and

means for securing said bridge element to said locking plate of said locking means.

4,187,753

KNIFE DRUM FOR CROSS CUTTING MACHINES

Peter Walde, Düsseldorf, Fed. Rep. of Germany, assignor to Jagenberg Werke Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Aug. 30, 1978, Ser. No. 938,181

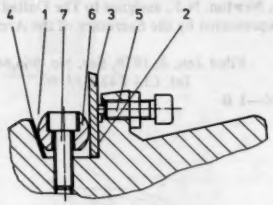
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1977, 2741560

Int. Cl.[2] B26D *1/36*

U.S. Cl. 83—674 **4 Claims**

1. A knife drum for a cross cutting machine and the like comprising: a drum having an axial groove; a knife inserted in the groove with one side abutting one side of the groove, wherein the space formed between the other side of the knife and the other side of the groove defines a downwardly tapering groove; and means for releasably clamping the knife in place comprising a plurality of round chocks mounted for selected positioning in the radial direction with respect to the drum and having an arcuate cross section with the largest

diameter greater than the smallest width of the tapered groove, whereby in response to the radial positioning thereof, the knife



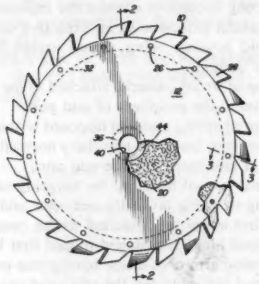
is alternatively clamped between the chocks and the one side of the groove or released.

4,187,754

NOISE DAMPENED ROTARY SAW BLADE

Loma B. Beaty, 113 NW. First St., Fort Payne, Ala. 35967

Filed Sep. 21, 1978, Ser. No. 944,310
Int. Cl.² B27B *33/08*
U.S. Cl. 83—847 **12 Claims**



1. A vibration damped rotary disk, said rotary disk including a pair of circular disk panels disposed in side-by-side superposed relation, said disk panels including shallow concentric and opposing annular recesses therein of a radial extent greater than one-half the radial extent of said panels and spaced inwardly of the outer marginal portions of said panels, a filler of mechanical vibration absorbing material disposed in and filling said recesses, and means securing the outer marginal portions of said disk panels together.

4,187,755

APPARATUS FOR CUTTING SHEET GLASS

Kazuya Shirai, No. 5-21, 3-chome, Kashitanishi, Higashiosaka-shi, Osaka, Japan

Filed Apr. 10, 1978, Ser. No. 894,851
Claims priority, application Japan, Apr. 15, 1977, 52-49497[U]
Int. Cl.² B26D *3/08*; C03B *33/02*
U.S. Cl. 83—882 **7 Claims**

1. An apparatus for cutting sheet glass comprising in combination:

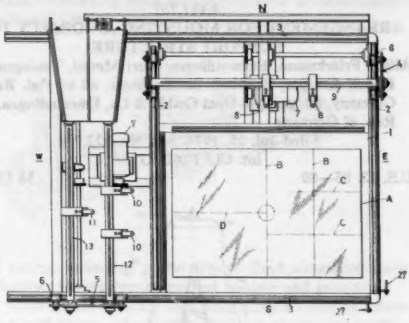
(a) a table (**1**) for placing a glass sheet thereon;

(b) a first and a second carriage (**4, 5**) adapted to travel along rails (**2, 3**) normal to each other, provided on longitudinally opposite sides and transversely opposite sides of the table;

(c) a rotatable horizontal shaft member (**9, 12, 13**) connected to each of said carriages, said shaft member being capable of turning at least from a first to a second position and return;

(d) cutters (**8, 10, 11**) secured to said shaft members (**9, 12, 13**) so as to be slidable therealong, said cutters being so disposed as to engage a glass sheet for cutting when said shaft is in said first position and removed from said glass sheet when said shaft is in said second position;

(e) a lever (**14, 15, 16**) coupled at one end to said shaft member; and,



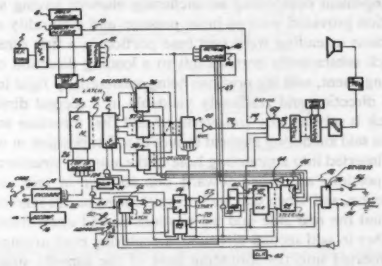
(f) engaging means (**19, 21, 25**) for engaging and securing said lever and changing the angle thereof so as to turn said shaft between said first and second positions.

4,187,756

AUTOMATIC ARPEGGIATOR

John W. Robinson, and Stephen L. Howell, both of Jasper, Ind., assignors to Kimball International, Inc., Jasper, Ind.

Filed Nov. 11, 1977, Ser. No. 850,591
Int. Cl.² G10H *1/00, 5/00*
U.S. Cl. 84—1.24 **19 Claims**



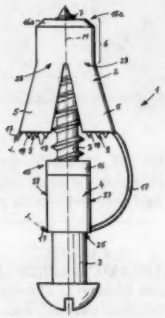
1. In an electronic organ having playing keys forming a keyboard and being grouped in a plurality of successively adjacent octaves, a multipitch tone generator, a transducer, a keyer connecting each pitch to the transducer, main multiplexer means for scanning the keys and developing a main data stream on each scan containing key-down signals in respective time slots corresponding to depressed keys, and demultiplexer means receiving said main data stream from the multiplexer means and actuating said keyers in conformity with said key-down signals, an arpeggiator comprising: second multiplexer means synchronized with said main data stream for developing an octave length second data stream containing key-down signals in time slots corresponding to notes of a selected chord played consecutively, arpeggio means for sequentially selecting successive octaves at a rate which is substantially lower than the rate at which said main multiplexer means scans said keys and for repetitively supplying said second data stream to said demultiplexer means only during the scanning of the selected octave by said main multiplexer means, said arpeggio means including variable frequency and variable duty cycle clock means for selectively controlling the rate at which said octaves are successively selected and for selectively control-

ling the duration and spacing of successive notes of the selected chord.

4,187,757
ARRANGEMENT FOR MOUNTING AN OBJECT TO A SUPPORT STRUCTURE

Albert Frischmann, Emmendingen; Kurt Mermi, Teningen, and Rudolf Königer, Buchholz-Batzenhäusle, all of Fed. Rep. of Germany, assignors to Upat GmbH & Co, Emmendingen, Fed. Rep. of Germany

Filed Jul. 25, 1978, Ser. No. 922,738
Int. Cl.[2] F16B *13/04*
U.S. Cl. 85—80 **54 Claims**

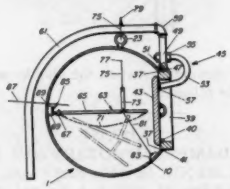


1. An arrangement for mounting an object to a support structure having a rear side which is difficult of access, the arrangement comprising an anchoring element having a base portion provided with an inner passage, and a plurality of leg portions extending from said base portion in a first direction which substantially corresponds to a loading direction of the arrangement, said leg portions being substantially rigid in said first direction and resiliently yieldable in a second direction which is substantially transverse to said first direction so that when said anchoring element moves to a first position in which it is inserted into a mounting hole of the support structure said leg portions are urged toward one another in said second direction, and when said anchoring element passes rearwardly beyond the rear side said leg portions spread apart from one another in said second direction; a centering bush arranged to be inserted into the mounting hole of the support structure after said anchoring element passes through the mounting hole, and having a further passage, said centering bush being connected with said anchoring element; connecting means including at least one flexible connecting member which extends between said anchoring element and said centering bush and connects them with one another; and a mounting element arranged for mounting the object to the support structure, said mounting element extending through said further passage of said centering bush and said inner passage of said base portion of said anchoring element and being operative for urging the latter in said first direction so that said leg portions of said anchoring element abut against the support structure at the rear side thereof, said anchoring member, said centering bush, and said connecting member being constituted by a synthetic plastic material and being of one piece with each other so as to form a one-piece unit whose anchoring element, including its base portion and leg portions, and centering bush all extend in said first direction when said anchoring element passes rearwardly beyond the rear side of the support structure, said centering bush is inserted in the mounting hole of the support structure, and said mounting element extends through said centering bush and said anchoring element.

4,187,758
BOMB CONTAINER WITH GRAVITY-CLOSED INTERNAL DOOR

Jon Petty, Newton, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 3, 1978, Ser. No. 866,667
Int. Cl.[2] F42B *33/00*
U.S. Cl. 86—1 B **3 Claims**



1. A bomb container comprising
a housing strong enough to contain the explosion products of an accidental explosion of an explosive device placed therein, said housing being closed except for a single access port therein;
a massive loop of strong material attached to the wall of said housing around the periphery of said port;
a massive door of strong material disposed within said housing with the outer face of its periphery normally fitting the inner face of said loop, to close said port;
means, external to said housing, for hingeing said door on said housing to swing inwardly and open said port, comprising a first hinge lug attached to the outside of said loop, a second hinge lug hinged to said first hinge lug, a hinge extension arm of U-shape having one end attached to said second hinge lug and the other end attached to the outer face of said door;
a safety operating arm attached to said second hinge lug at one end and extending over the top and down the back side of said housing, and said housing is spherical and is normally supported with said door disposed in a substantially vertical plane and with said hinge lugs located at the top thereof; whereby the weight of said door and of said operating arm keep said door normally closed.

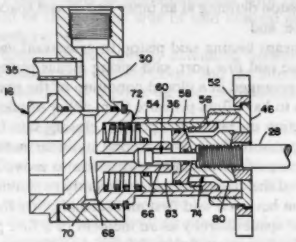
4,187,759
SEPARATION NUT SYSTEM

Henry Toy, Los Altos; Phillip Bernstein, Sunnyvale, and Johan C. Van der Zwaan, Los Altos, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 16, 1977, Ser. No. 833,834
Int. Cl.[2] F42B *15/10*
U.S. Cl. 89—1 B **6 Claims**

1. A separation nut system comprising:
(a) a plurality of separation nut assemblies, each having an initiator;
(b) a plurality of bolt catcher assemblies, one connected to each of said separation nut assemblies by a bolt;
(c) a manifold tube connecting each of said separation nut assemblies to the others such that the actuating gas generated by the initiator of one of said separation nut assem-

blies is distributed to actuate all of said separation nut assemblies; and



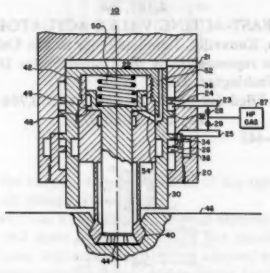
(d) means for automatically restoring each of said separation nut assemblies to its initial condition after each actuation.

4,187,760

INFLIGHT, STORES, FORCES AND MOMENTS MEASURING DEVICE

Lloyd J. Holt, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 19, 1978, Ser. No. 943,885
Int. Cl.[2] B64D *1/04*; F41F *5/02*
U.S. Cl. 89—1.5 E **10 Claims**



1. A measuring device for measuring the inflight forces and moments on a store carried by an aircraft comprising:

a mounting member

latch means for engagement with said store and configured to restrain the store against relative movement therebetween and for transmissions of loading stress therealong, said latch means being effectively connected to, and carried by said mounting member;

and pressure sensing means positioned between said mounting member and said latch means for sensing inflight forces on said store.

4,187,761

VARIABLE FORCE CONTROL SYSTEM FOR WEAPON EJECTION MECHANISMS

Lloyd J. Holt, China Lake, and Clayton E. Panlaqui, Ridgecrest, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

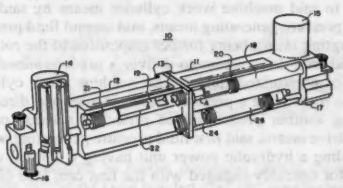
Filed Sep. 19, 1978, Ser. No. 943,886
Int. Cl.[2] B64D *1/04*; F41F *5/02*
U.S. Cl. 89—1.5 R **11 Claims**

1. A variable-power, dual ejector for an aircraft weapon stores structure in a system having sensors for measuring inflight aerodynamic induced forces on the stores comprising:

a stores structure carried by the aircraft for carrying stores thereon;

fluid actuated ejector means on said stores structure for ejecting stores from said structure;

a source of working fluid in effective fluid communication with said ejector means;



said source including a plurality of fluid chambers, each chamber having predetermined volume and pressure;

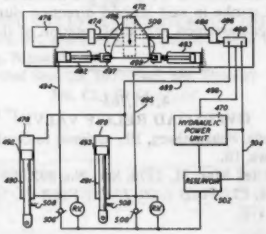
and valve means between said fluid actuated ejector means and said source of working fluid selectively controlling the release of said working fluid in said source.

4,187,762

DRIVE AND MOTION SYNCHRONIZING APPARATUS FOR A HYDRAULIC SYSTEM

Nicholas L. Buzby, 923 Williams Dr., Palatine, Ill. 60067

Continuation-in-part of Ser. No. 768,550, Feb. 14, 1977, abandoned. This application Dec. 27, 1977, Ser. No. 864,761
Int. Cl.[2] F15B *21/02, 7/02*
U.S. Cl. 91—37 **8 Claims**



1. A cam-operated pressure transmitting and control apparatus for the operation of cyclic machine functions comprising:

a base frame;

a cam drive means supported on said base frame and having a pair of cam faces thereon;

means to rotatably drive said cam drive means;

a first and second fluid pressure generating means each being arranged to coact with a different one of said pair of cam faces;

a work cylinder means associated with machine functions;

a hydraulic fluid pressure system interconnecting said work cylinder means and said first and second fluid pressure generating means, whereby said first fluid pressure generating means is responsive to rotation of a first cam face of said pair of cam faces to deliver pressurized fluid to said machine work cylinder means to provide a predetermined pressure stroke therein in a first direction during a first predetermined period of rotation of the cam drive means; and

cam follower means to accurately control the movement of said work cylinder means in said first direction, being associated with said second fluid pressure generating means and operably engaging a second cam face of said pair of cam faces, and being responsive thereto to regulate a flow of pressurized fluid directed to said work cylinder

means by said first fluid pressure generating means by controlling an outflow of fluid from said work cylinder means and

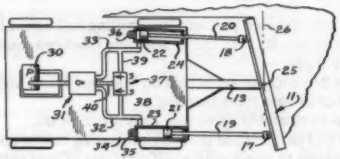
into said second fluid pressure generating means, wherein said second fluid pressure generating means is responsive to rotation of the cam drive means to regulate a predetermined volume and rate of flow of pressurized fluid delivered to said machine work cylinder means by said first fluid pressure generating means, said second fluid pressure generating means being further responsive to the rotation of said cam drive means to deliver a predetermined volume of pressurized fluid to the machine work cylinder means to provide a pressure stroke in a second direction during another predetermined period of rotation of the cam drive means, said first fluid pressure generating means including a hydraulic power unit having a control valve therefor operably engaged with the first cam face of said pair of cam faces, said control valve being responsive to the rotation of said first cam face to direct pressurized fluid to said work cylinder means to provide said pressure stroke in said first direction and wherein said second fluid pressure generating means includes a power/control cylinder having the cam follower means carried thereon for operable engagement with the second cam face of said pair of cam faces, being responsive to the rotation of said second cam face to control the predetermined volume and rate of flow of pressurized fluid delivered to said machine work cylinder by said hydraulic power unit to provide the pressure stroke in said first direction during said first predetermined period of rotation of the cam drive means by controlling the fluid expelled from said work cylinder means and directed to said power control cylinder and further being responsive to the rotation of said second cam face to deliver said predetermined volume of pressurized fluid to said machine work cylinder means to provide said pressure stroke in said second direction during said another predetermined period of rotation of the cam drive means.

4,187,763

OVERLOAD RELIEF VALVE

Vinod K. Nanda, Schaumburg, Ill., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Mar. 31, 1978, Ser. No. 892,088
Int. Cl.[2] F01B *1/00, 15/00;* F15B *11/16*
U.S. Cl. 91—176 **6 Claims**



1. In an apparatus having a working element defining first and second spaced support portions, a first cylinder having a piston provided with a rod connected to said first support portion, a second cylinder having a piston provided with a rod connected to said second support portion, and adjustably controlled hydraulic supply means connected to said cylinders and including a return tank for providing hydraulic fluid to said cylinders for adjustably positioning said piston rods to position and retain said working element as desired, improved pressure relief means comprising:

a body defining a piston chamber, a first port opening to said chamber and connected to said first cylinder, a second port opening to said piston chamber and connected to said second cylinder, and a third port opening to said piston chamber and connected to said return tank;

a piston in said chamber having a valve portion removably seating on said body at said first port for selectively closing said first port and defining in said chamber an annular space communicating with said second port at all times, said piston defining at an inner end of said space a pressure surface; and

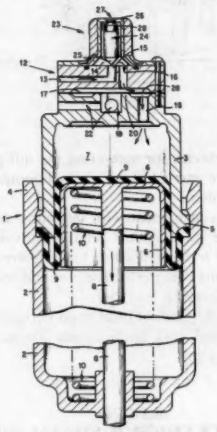
spring means biasing said piston to cause said valve portion to close said first port, said spring means piston and ports being arranged in a closed condition of the pressure relief means to have fluid pressure from either of said first cylinder acting on said valve portion closing said first port or fluid pressure from said second cylinder acting on said pressure surface to cause said piston to move against the action of the biasing means sufficiently to provide communication between said first and second ports through said annular space thereby as an incident of a first preselected high fluid pressure being delivered to either of said first and second ports, and to cause said piston to move further against the action of the biasing means and provide communication between said first, second and third ports through said piston chamber to dump fluid therethrough to said return tank as an incident of a second preselected, cumulative fluid pressure higher than said first preselected pressure resulting from high fluid pressure being delivered to said first and second ports concurrently, said piston having a piston rod movably engaging said body for guiding said piston in the movement thereof by said fluid pressures, said spring means comprising a coil spring concentric about said piston rod between said piston and said body.

4,187,764

FAST-ACTING VALVE ACTUATOR

Nakwon Cho, Knoxville, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 12, 1972, Ser. No. 270,796
Int. Cl.[2] F01B *3/00*
U.S. Cl. 91—442 **5 Claims**



1. A fast-acting valve actuator comprising:

(a) a piston housing;

(b) a piston reciprocably mounted within said housing having a spring driven side and a pneumatically loaded side;

(c) a connecting rod fixed to the spring driven side of said piston and extending out of said housing;

(d) a spring disposed within said piston housing acting on the spring driven side of said piston;

(e) an air inlet and exhaust assembly defining:

(i) a disk-shaped control cavity having opposed air supply and exhaust sides;

(ii) an air supply passageway in communication with the air supply side of said control cavity;

(iii) an exhaust port in communication with the central portion of the exhaust side of said control cavity and atmosphere; and

(iv) a connecting passageway extending between the exhaust side of said control cavity and the interior of said piston housing at a point on the pneumatically loaded side of said piston;

(f) a flexible diaphragm disposed intermediate the air supply and exhaust sides of said control cavity, said diaphragm being slit at an intermediate radial position to provide fluid communication between said air supply passageway and said connecting passageway; and

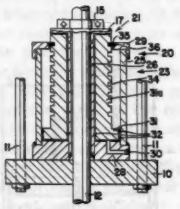
(g) means for selectively admitting pressurized air to said air supply passageway and venting said air supply passageway to the atmosphere.

4,187,765

APPARATUS FOR PUMPING FLUID FROM A WELL

Roland W. Mattoon, P.O. Box 1302, Drayton Valley, Alberta, Canada

Filed Dec. 29, 1977, Ser. No. 865,466
Claims priority, application Canada, Feb. 21, 1977, 272181
Int. Cl.[2] F04B 1/06
U.S. Cl. 92—13.1 **5 Claims**



1. A device for varying the downstroke of the operating rod of a bottom hole pump, comprising:

a normally vertical hydraulic cylinder of annular form having outer and inner cylindrical walls and annular top and bottom plates, said inner wall being adapted to surround the said pump operating rod, said cylinder having an inlet for hydraulic fluid at its lower end, and being suitable for being carried by the operating mechanism of said pump,

an annular piston movable in said cylinder in sealing engagement with the outer and inner walls, said piston including an extension of such length as to be adjacent or above the top of said cylinder when the lower end of the piston is at the bottom of the cylinder, said extension having a series of detents in the outer surface thereof selectively engageable by holding means, which holding means are also engageable with the top plate of the cylinder to hold the piston in a selected raised position, said piston carrying means engageable with said operating rod to vary the downstroke thereof.

4,187,766

FLUID DEVICE AND METHOD FOR MAKING

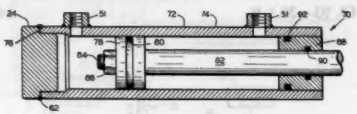
Richard P. Gaylord, St. Joseph, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Jun. 16, 1978, Ser. No. 916,376
Int. Cl.[2] F16J 11/02, 15/18
U.S. Cl. 92—169 **15 Claims**

1. A tube and end element assembly for a reciprocating fluid device, which tube and element assembly comprises an end element having an inner end and an outer end;

a cylindrical tube having first and second ends, having a first inside diameter portion that is proximal to said first end, and being joined to said end element by a bonded joint with said first end disposed proximal to said inner end; and

means, comprising a stressing member having a substantially circular outside diameter that is larger than said first inside diameter portion, and being inserted into said first inside diameter portion proximal to said first end, for mechani-



cally inducing an elastic diametral tensile strain in said tube proximal to said bonded joint and intermediate of said bonded joint and said second end; whereby

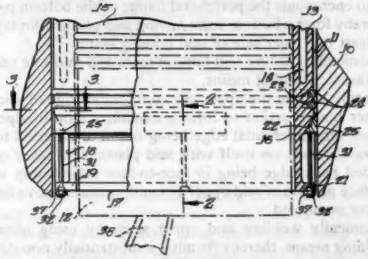
said mechanically-induced elastic diametral tensile strain reduces a cyclic diametral straining of said tube proximal to said bonded joint when cyclic fluid pressures are applied inside said tube.

4,187,767

DIESEL CYLINDER HEAD AND LINER

Robert H. Jones, Jr., and Richard B. Jones, both of 1321 E. 39th St., Hibbing, Minn. 55746

Filed Sep. 15, 1977, Ser. No. 833,497
Int. Cl.[2] F16J 11/04
U.S. Cl. 92—171 **10 Claims**

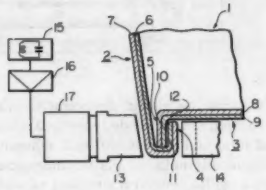


1. In a diesel cylinder engine, in combination with a diesel engine block having a generally cylindrical bore therein, a diesel cylinder head adapted to be secured to the block, a cylinder liner adapted to be secured to the cylinder head and received in the bore, said liner having a generally cylindrical exterior surface and an interior cylindrical surface to receive a reciprocating piston therein, a plurality of clamping wedges circumferentially equally spaced about said liner and adapted to be positioned between the exterior surface of the cylinder liner and the surface of the bore adjacent the lower end of the liner to retain the liner in its operative position in the bore, said clamping wedges each having a surface generally paralleling the surface of said bore and an oppositely disposed inclined surface engaging the exterior surface of said liner, and a clamping bolt having a threaded end engaging a threaded opening in and actuating each wedge.

4,187,768
METHOD FOR THE MANUFACTURE OF A PAPER CONTAINER

Shoichi Suzuki, Tokyo, Japan, assignor to Nihon Dixie Company, Limited, Tokyo, Japan

Filed Mar. 10, 1978, Ser. No. 885,259
Claims priority, application Japan, Nov. 15, 1977, 52-137184; Nov. 28, 1977, 52-142370
Int. Cl.² B31B *1/66, 17/02*
U.S. Cl. 93—39.1 R **14 Claims**



1. A method for the manufacture of a paper container having a substantially non-deformable upper mouth edge comprising the steps of:

blanking out a bottom panel component and a body component from a sheet of paper material having a coating of thermoplastic film applied to at least one side of said paper material, said body component having opposite side ends, an upper edge, a lower end and a lower edge;

downwardly bending the peripheral edge of said bottom panel at right angles to the plane of the bottom panel to form a peripheral flange;

positioning said peripheral flange of the bottom panel slightly above the lower edge of said container body component;

rolling said body component so as to bring the opposite side ends of the container body component into slightly overlapping relationship so as to form a container body wall having a side seam extending in a longitudinal direction along the body wall;

inwardly and upwardly bending the lower end of the container body wall along the peripheral flange of the bottom panel so as to encompass the peripheral flange of the bottom panel to thereby form a bottom seam having said plastic film layer on at least one inner side of said bottom seam;

ultrasonically welding said bottom seam and said side seam by ultrasonic welding means;

outwardly curling the upper circumferential edge of said container body portion to form a container mouth edge, said upper circumferential edge being outwardly curled to fold inwardly back on itself with said plastic film layer of said folded back edge being in face-to-face relationship with a surface portion of said upper circumferential edge to form an upper seam; and

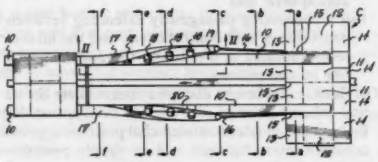
ultrasonically welding said upper seam by using ultrasonic welding means, thereby forming a substantially non-deformable ultrasonically welded upper mouth edge.

4,187,769
APPARATUS FOR FOLDING BOX BLANKS

Allen R. Bullock, Stockport, England, assignor to Simon Container Machinery Limited, Stockport, England

Filed Apr. 10, 1978, Ser. No. 895,063
Claims priority, application United Kingdom, Apr. 19, 1977, 16117/77
Int. Cl.² B31B *1/36*
U.S. Cl. 93—52 **5 Claims**

1. Apparatus for folding box blanks wherein each blank comprises a first portion and at least one further portion to be folded inwardly to lie over the first portion in superimposed relationship therewith, the apparatus including means for conveying the blanks successively through the apparatus during folding, means for progressively manoeuvering said further portion of each blank into the said folded position as the blank is conveyed, stationary means disposed to lie, in use, above the blank adjacent a line along which the further portion is to be folded so as to hold the blank against the conveying means, and a pair of elongate flat tongues, one above the other, extending

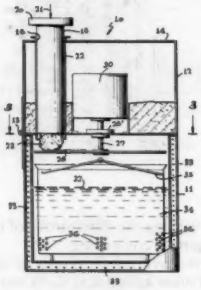


along the conveyor and spaced apart in their upstream end regions with respect to the direction of travel of the conveyor, by a member disposed between the opposed faces of the tongues, the tongues tending towards a face-to-face abutting relationship in their downstream end regions.

4,187,770
POTATO CHIP COOKING APPARATUS

Harold M. Coffield, 41120 N. 15th St. West, Palmdale, Calif. 93550

Filed May 30, 1978, Ser. No. 910,458
Int. Cl.² A47J *37/12*
U.S. Cl. 99—353 **1 Claim**



1. A potato chip cooking apparatus comprising the combination of;

a cylindrical vat for holding a quantity of cooking oil;

a basket having perforated sidewall disposed in said vat partially submerged in said cooking oil;

a lid hingably carried on said vat and coaxially disposed with respect to said vat so that said lid pivots away from said vat to expose said basket;

a feeder means carried on said lid for introducing a raw potato to said vat;

cutting means operably carried on said lid and downwardly depending therefrom for engaging said raw potato and slicing a portion thereof so as to drop into said basket and cooking oil therebeneath;

electrical means for operating said cutting means and for heating said cooking oil;

said cutting means includes a circular platform having an arcuate opening therein and a cutting blade carried on said platform adjacent said opening;

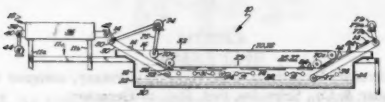
said platform coupled to said electrical means in driving relationship so as to foricbly urge said potato portion;

said feeder means includes a sleeve mounted on said lid;

a plunger slidably carried in said sleeve and adapted to rest on top of said raw potato urging said raw potato into contact with said platform;

a plurality of prongs downwardly depending from one end of said plunger releasably engagable with said raw potato;
bracket means securing said electrical means for driving said platform to said lid;
handle means attached to said vat exteriorly for grasping by the user for moving said apparatus from place to place; and
said rotating platform resides within the confines of said vat when said lid is closed on top of said vat.

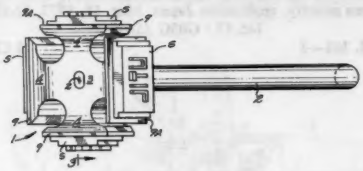
4,187,771
FRYING APPARATUS
Jack D. Westover, Burnsville, and Richard L. Keller, Minneapolis, both of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.
Filed Oct. 31, 1977, Ser. No. 846,963
Int. Cl.[2] A47J *37/12*
U.S. Cl. 99—404 **6 Claims**



1. A food fryer for cooking a flat farinaceous dough food product comprising a frying vessel having an inlet end and an outlet end and being adapted for holding fat, a heater for the fat in the vessel, an inlet conveyor having an upper run portion inclined downwardly into the vessel from the inlet end, a hold-down conveyor having a feed end adjacent the inlet end with the hold-down conveyor extending generally horizontally from one end of the vessel to the other, drive means connected to the hold-down conveyor for advancing the conveyor, said hold-down conveyor having an endless conveyor element including upper and lower runs, the lower run being located in close enough proximity with the frying fat to engage the product to be fried, said hold-down conveyor further including a generally planar intermediate run between a pair of conveyor supports, at the feed end and extending between the upper run and lower run at an incline and spaced from and generally parallel to the inlet conveyor upper run portion, an upper end portion of the intermediate run being positioned above the surface of the fat, said product being bouyed by said fat into contact with said lower run, said hold-down conveyor comprising an open wire mesh defining a plurality of openings therein, said mesh being disposed in a generally flat horizontal plane along said lower run and said openings being operable to allow portions of the top surface of food product bouyed by said fat into contact with said wire mesh expand upwardly into said openings during frying to form on said surface a corresponding plurality of upwardly projecting blisters having side walls which engage the wires of the mesh and prevent slippage between the food product and the conveyor.

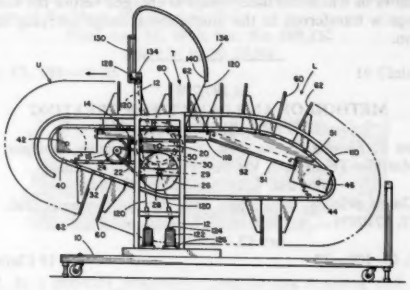
4,187,772
HAND OPERATED FLEXIBLE STAMP CARRIER
Paul R. Hollenbeck, Star Rte. Box 98, Eastsound, Wash. 98245
Filed Mar. 28, 1978, Ser. No. 890,959
Int. Cl.[2] B41K *1/04, 1/28*
U.S. Cl. 101—379 **1 Claim**

1. A hand operated stamp carrier on which a plurality of flexible stamps are resiliently supported, said stamp carrier comprising,
a handle,
a central body portion affixed to one end of said handle,
yieldable appendages molded integral with and projecting outwardly from said central body portion,
yieldable stamp support members molded integral with the distal ends of said appendages but having a greater hardness rating than that rating of said appendages,
said central body portion, appendages and stamp support member being of unitary molded construction,
said appendages each having front, rear and sidewalls all converging in an inward direction to provide appendages



of substantially reduced section at mergence with the central body portion to render the appendages highly yieldable in the presence of asymetrical forces acting on said stamp support members to prevent distortion of a flexible stamp therein.

4,187,773
BUNDLE TYING MACHINE
Jacob Sampson, 6138 N. Clark St., Chicago, Ill. 60660
Filed Aug. 17, 1978, Ser. No. 934,632
Int. Cl.[2] B65B *13/22*
U.S. Cl. 100—4 **30 Claims**

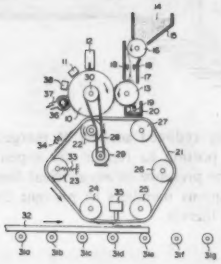


1. In a bundle tying machine having in sequence a loading zone and a bundle tying zone, and an endless conveyor which travels through said loading zone and bundle tying zone, a plurality of longitudinally spaced apart pairs of longitudinally spaced plates carried by the conveyor in outwardly spaced apart relation from the conveyor, means for guiding the conveyor for travel along a concave curvilinear path during passage through the loading zone and along a straight horizontal path during travel through the bundle tying zone whereby the plates in the pair extend angularly in the direction away from each other to provide increased spaced relation therebetween while travelling with the conveyor through the loading zone and a minimum spaced relation therebetween during travel with the conveyor through the bundle tying zone, stationary support means in substantially parallel relation with the conveyor spaced outwardly of the conveyor but inwardly of the plates for support of the material inserted between the plates whereby the material is easily inserted between the plates during travel through the loading zone and compressed between the plates during subsequent travel through the bundle tying zone.

4,187,774
ELECTROSTATIC PRINT MARKING APPARATUS

Masakazu Iwasa; Hisashi Kato, and Yoshio Kudo, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Mar. 14, 1978, Ser. No. 886,447
Claims priority, application Japan, Mar. 15, 1977, 52-28364
Int. Cl.[2] G03G *15/00*
U.S. Cl. 101—1 2 Claims

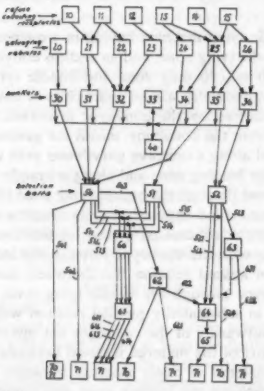


1. An electrostatic print marking apparatus for printing markings on steel plates wherein an electrostatic latent image is developed into a toner image and the toner image is transferred to an intermediate image carrying medium, and the toner image transferred to the intermediate image carrying medium is transferred to a steel plate, wherein the improvement comprises a DC charger provided in the vicinity of said intermediate image carrying medium for re-charging the toner image carried on the intermediate image carrying medium before the toner is transferred to the steel plate in the same polarity as the polarity in which the toner image is charged before the toner image is transferred to the intermediate image carrying medium.

4,187,775
METHOD OF AND DEVICE FOR TREATING HETEROGENEOUS WASTE

Hans F. Flender, Neuss, Fed. Rep. of Germany, assignor to Matthias Trienekens, Viersen, Fed. Rep. of Germany

Filed Jul. 7, 1978, Ser. No. 922,540
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1977, 2730671
Int. Cl.[2] B30B *13/00*
U.S. Cl. 100—39 19 Claims

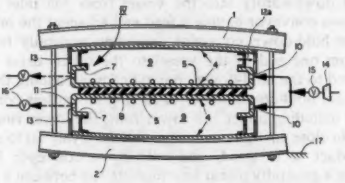


1. A method of treating at a treatment site heterogeneous waste from household garbage and industrial refuse, which includes the steps of: at said treatment site providing a plurality of discrete reception areas for respectively receiving waste according to the different general compositions of said waste and according to the respective collecting techniques employed; subsequently carrying out a selection and distribution of the waste at said reception areas; distributing the selected waste into streams of specific waste types; and subjecting said streams of specific waste types to individual treatments comprising at least one of the treatment types of breaking, separating, and sorting to thereby respectively obtain the selected products, while combining streams of like waste types from different selection areas for common treatment.

4,187,776
BELT PRESS

Rolf Schroder, Wuppertal, Fed. Rep. of Germany, assignor to Wagener & Co., Schwelm, Fed. Rep. of Germany

Filed Jul. 26, 1978, Ser. No. 927,974
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1977, 2734025
Int. Cl.[2] B30B *5/02, 15/34*
U.S. Cl. 100—93 P 7 Claims



1. A belt press comprising:
vertically spaced upper and lower traverses;
upright links extending between said traverses and immovably positioning same relative to each other;
respective upper and lower traverse plates on said traverses having respective lower and upper imperforate surfaces having outer peripheries;
respective upper and lower press plates adjacent and generally parallel to said traverse plates and having respective lower and upper imperforate surfaces having outer peripheries;
respective upper and lower guide skirts on said traverse plates and surrounding the respective press plates, each of said press plates being vertically guided in the respective skirt;
respective rigid upper and lower reinforcing rims on said upper and lower press plates at the respective outer peripheries thereof, each of said rims extending from the respective press plate toward the respective traverse plate;
respective upper and lower annular membranes each having one end secured to the respective rim and another end secured to the periphery of the respective traverse plate, each membrane forming with the respective upper and lower surfaces a pressurizable chamber;
means including respective upper and lower heaters in said chambers for heating the respective press plates; and
means including ports in said press plates for pressurizing said chambers to compress a belt between said press plates with concomitant deformation of said traverses and of said traverse plates.

4,187,777

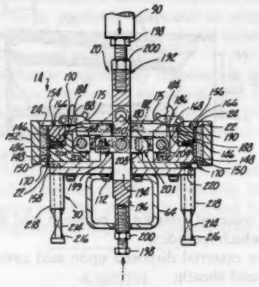
APPARATUS FOR BONDING BRAKE LININGS

William L. Pringle, Grosse Pointe Shores, Mich., assignor to Leonard Friedman, Beverly Hills, Calif.

Filed Nov. 13, 1978, Ser. No. 960,456

Int. Cl.[2] B30B *15/04, 13/34*

U.S. Cl. 100—93 PB **23 Claims**



1. An apparatus for bonding brake linings to tables of brake shoes with an application of heat and pressure which comprises: a load ring constructed and arranged to encircle a pair of generally opposed brake shoes and brake linings received between the ring and the shoes and aligned to be bonded to the tables of the shoes, a pair of pressure blocks received within said ring in spaced apart generally opposed relation to each other and each constructed and arranged to bear on at least a substantial portion of the surface of the inner face of the table of one of the brake shoes received within the pressure ring, at least a portion of each pressure block bearing on the rear face of the table of a brake shoe being of a material having good thermal conductivity, actuator means operably associated with said blocks and constructed and arranged to force said blocks generally radially outwardly to apply sufficient force to the brake shoes to urge the tables of the brake shoes and the linings firmly together, said blocks and said ring being constructed and arranged to permit rotation of one relative to the other when said blocks are retracted with respect to said ring, and heating means operably associated with each of said pressure blocks and constructed and arranged to transfer heat by conduction through the tables of said brake shoes to heat a bonding material received between the brake linings and the tables of the shoes to an elevated curing temperature.

4,187,778

APPARATUS FOR PRINTING AND DISPENSING LABELS

Günter Holland-Letz, Hirschhorn, Fed. Rep. of Germany, assignor to Dymo Industries, Inc., San Francisco, Calif.

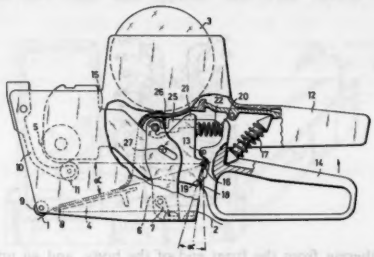
Filed Feb. 28, 1978, Ser. No. 882,627

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1977, 2708728

Int. Cl.[2] B41F *1/08*

U.S. Cl. 101—291 **7 Claims**

1. Apparatus for printing and dispensing labels of a label strip, having (a) a transport device for the stepwise advancement of the label strip in the course of each operating cycle, (b) a printing table over which the label strip is conducted, (c) a printer which is arranged for movement with respect to the printing table and having associated therewith an inking device, (d) a hand lever pivotable about a pivot axis held in a braced position by a return spring, (e) a printer lever, which pivots through a predetermined angle in response to pivotal movement of the hand lever against said return spring, (f) the printer rigidly secured to the said printer lever, the inking device and the transport device being operationally connected to said printer lever, and (g) said printer lever having an abutment face which is maintained contiguous to an abutment face of the hand lever by a second spring arranged between the hand lever and the printer lever, whereby motion of said hand lever against said return spring is transmitted to said printer lever via said second spring to thereby move the printer towards the printing table as said printing lever is pivoted through said predetermined angle, wherein the improvement



comprises the pivot axis of the printer lever being disposed between the pivot axis and the abutment of the hand lever when it is in its braced position, said printer lever pivot axis being in the closer to of the pivot axis of the hand lever than to the abutment whereby the angle through which the printer rotates is greater than the angle through which the hand lever rotates for a given angle of hand lever rotation.

4,187,779

MARINE MINE

Harry S. Jones, East Orange, N.J.; David B. Kirkpatrick, Oreland, Pa., and Robert G. Wilson, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 19, 1945, Ser. No. 589,228

Int. Cl.[2] F42B *22/04*

U.S. Cl. 102—18 M **19 Claims**

1. In a pressure responsive mine having a casing and an arming and firing circuit therein, a pressure responsive device mounted in the casing and exposed to the pressure of the sea water, a second pressure responsive device mounted in the casing, a fluid connection between the first and second pressure responsive devices, a third pressure responsive device mounted in the casing, a restricted fluid pressure responsive connection between the second and third pressure responsive devices, and a circuit making and breaking device positioned in the restricted connection between the second and third pressure responsive devices and connected in the arming and firing circuit.

4,187,780

DETONATING CORD AND BLASTING CAP CONNECTOR BLOCK

Guy S. Petruccelli, Simsbury, Conn., assignor to Ensign-Bickford Company, Simsbury, Conn.

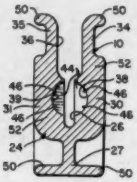
Filed May 10, 1978, Ser. No. 904,393

Int. Cl.[2] F42B *3/10*

U.S. Cl. 102—28 R **9 Claims**

1. An elongated connector block for mounting an elongated blasting cap and a detonating cord in side-by-side association for intimately connecting them for side initiation, comprising a

longitudinally extending body of generally U-shaped transverse cross section having an intermediate longitudinally extending slot the full length thereof and a pair of opposed sides on opposite sides of the slot contoured to provide an enlarged elongated blasting cap cavity extending longitudinally from a front end of the body along at least a portion of said slot for longitudinally inserting and receiving an elongated blasting



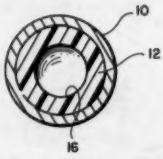
cap therein from the front end of the body, and an upward integral extension of at least one side of the body forming a pinch-cleat for longitudinally positioning a flexible detonating cord along the slot in intimate parallel side-by-side association with and above a blasting cap inserted in said cavity and for retaining the detonating cord in said position by winding it about the pinch-cleat extension.

4,187,781

CASELESS AMMUNITION

Joseph E. Flanagan, Woodland Hills, and George A. Lo, Canoga Park, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 13, 1972, Ser. No. 306,960
Int. Cl.[2] F21B *43/06*
U.S. Cl. 102—38 CC **9 Claims**



1. In caseless ammunition comprising:
a projectile,
a hollow cylinder disposed about the sides of said projectile and extending rearwardly therefrom and formed of a layer composed of a conventional propellant and an outer layer covering the exterior surface of said inner layer, and
a primer closing the rear end of said cylinder;
the improvement consisting of forming said outer layer of a polynitroaromatic material with a phosphorus-containing hydroxy-terminated polyether binder.

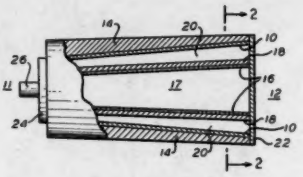
4,187,782

SHAPED CHARGE DEVICE

Fred I. Grace, York, Pa., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 26, 1978, Ser. No. 900,225
Int. Cl.[2] F42B *13/10*
U.S. Cl. 102—56 SC **8 Claims**

1. A shaped charge device for a projectile comprising:
a flared sheath formed of ductile material;
a body of explosive material having a hollow formed therein for operatively holding said sheath which includes;
an annular cross section disposed upon the surface of said sheath, wherein said sheath has a forward and an aft end, said body of explosive material having a thickness which decreases from said aft to said forward end;
an elongated casing formed of ductile material coaxially mounted within and spaced from said sheath, said sheath providing a diverging interspace between said casing and said sheath; and



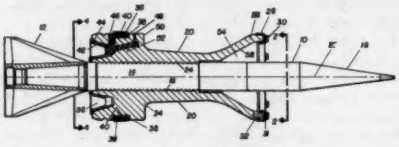
a layer of material interposed between said sheath and said casing which includes;
explosive material disposed upon said casing and spaced from said sheath;
a compressible spacer mounted between said sheath and said casing.

4,187,783

DISCARDING SABOT MUNITION

Ralph F. Campoli, Mine Hill; Elie L. Barrieres, Morris Plains; John W. Bannat, Lake Hopatcong, all of N.J.; Edwin G. Steiner, Jesup, Iowa; Thomas A. Lynch, Waterloo, Iowa, and Gary M. Miller, Waterloo, Iowa, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 13, 1978, Ser. No. 885,715
Int. Cl.[2] F42B *13/16*
U.S. Cl. 102—93 **5 Claims**



1. A discarding sabot munition which comprises:
a subcaliber projectile having an ogive front end, a tail end and a tubularly shaped midsection, said midsection having a plurality of external concentric buttress grooves circumferentially disposed therein;
segmented sabot means, for acting as a full caliber carrier for said subcaliber projectile, for efficiently obturating propellant gases during projectile launch, for transmitting only part of the spin imparted by gun rifling, for preventing inbore balloting during launch and for discarding swiftly and cleanly from said subcaliber projectile after launch, which includes;
a plurality of saddle shaped undercut arcuate sabot segments peripherally positioned around the circumference of said tubularly shaped midsection of said projectile and circumambient to a longitudinal axis of said subcaliber projectile, each of said sabot segments having a tubular internally concentrically grooved surface therein meshing with said external concentric buttress grooves of said subcaliber projectile, each of said sabot section having a forward bourrelet end and an aft bourrelet end, said forward bourrelet end having a plurality of longitudinally peripherally positioned threaded bolt holes therein and a conically shaped section disposed on an inner surface of said forward bourrelet end, said aft bourrelet end of each sabot seg-

ment having an arcuate obturator groove circumferentially disposed therein, and an annular seal groove disposed in an aft face, said seal grooves forming a scoop area for said propellant gases, and a pair of seal holes communicating with said seal groove and said obturator groove by means of an elastomer passageway located therebetween;

a slip ring fixedly disposed in said arcuate obturator grooves;

an obturator band, rotatably disposed in said obturator groove of said aft bourrelet ends of said sabot segments, slidably fitting upon said slip ring;

compliant seal means operatively disposed in said annular seal groove intermediate said sabot segments for preventing propellant gases from entering the space between said sabot segments and between said sabot segments and said projectile; and

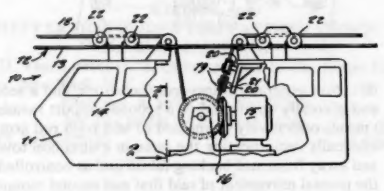
forward bourrelet flange means fixedly attached to a lip of said forward bourrelet end for releaseably holding said sabot segments together during launch and for releasing said sabot segments from said projectile after launch.

4,187,784

SELF PROPELLED CABLE CAR

Arthur A. Fernandez, c/o George Spector 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Mar. 7, 1977, Ser. No. 774,906
Int. Cl.[2] B61B 7/06
U.S. Cl. 104—235 **1 Claim**



1. A self propelled cable car, comprising a combination, a cable car having an enclosed body including flanged wheels mounted on top to be adapted for travel on a cable way, including a motor mounted in said car rotating a drum adapted to receive a hawling cable wound thereon, said drum being designed to receive multiple adjacent coils to increase frictional engagement therebetween, including means for varying the diameter of the drum engaged by said hawling cable, wherein said drum is of conical shape, said drum being engaged by splines to a splined shaft extending therethrough, said splined shaft being rotated by said motor, a flange on said drum being guided in a groove of a nut threadingly engaged on a threaded shaft which through gearing is rotated by a second motor for axially sliding said drum on said splined shaft.

4,187,785

PORTABLE TABLE

Yang R. Juh, 193 Ta-Lung St., Taipei City, Taiwan

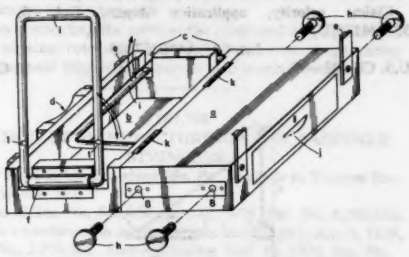
Filed Oct. 20, 1977, Ser. No. 844,054
Int. Cl.[2] A47B 3/08
U.S. Cl. 108—36 **4 Claims**

1. A collapsable table comprising: a first table body having a bottom and side walls each extending upward from the interior surface of said bottom to an edge;

a second table body having a bottom and side walls each extending upward from the interior surface of the bottom of said second body to an edge;

hinge means pivotably connecting said first and second bodies along an edge of each for movement between an open position in which the interior of said first body is accessible for receiving leg members to be stored, and a closed position in which respective edges of said first and second bodies are in contact;

first and second leg members pivotably connected to opposite side walls of said first body along the outside thereof for movement between a position supporting said bodies in said closed position to a position substantially within said first body, said opposite side walls having slots



therein for permitting said pivotable movement of said leg members into said first body and said leg members each comprising two separated and downwardly extending legs connected together along their pivotal connection to said side walls; and

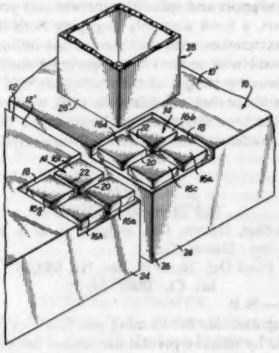
removable fastener means for fastening each of said legs to a side wall of said second table body along the outside thereof when said bodies are in closed position.

4,187,786

INTERLOCKING ETAGERE SYSTEM

Stephen Feig, Dix Hills, N.Y., and William T. Vincent, Leominster, Mass., assignors to Plascor Incorporated, Woodbury, N.Y.

Filed Dec. 4, 1978, Ser. No. 966,164
Int. Cl.[2] A47B 96/00
U.S. Cl. 108—64 **2 Claims**



1. An interlocking etagere system having shelves and legs comprising a shelf including depending aprons and corners, each corner defining a topside segmented shelf block defining block grooves dividing said shelf blocks into a plurality of segments; and each leg including first and second ends, said first end defining a first leg hollow and said second end defining a leg shoulder upstanding from which is a plurality of right angle leg segments separated by bifurcations, said leg segments defining a second leg hollow of lesser dimensions than said first leg hollow, all adapted and arranged such that said first leg hollow fits over block segments from more than one shelf and

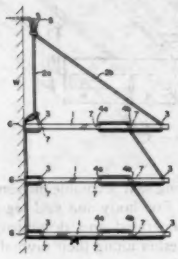
said aprons of more than one shelf fit within said bifurcations to interlock said more than one shelf.

4,187,787

ROPE-SUSPENDED SHELVING UNIT

Daniel T. Nakatsu, 117 Westwood Dr., San Francisco, Calif. 94112

Filed Jun. 19, 1978, Ser. No. 917,107
Claims priority, application Japan, Oct. 5, 1977, 52/134175[U]
Int. Cl.² A47B 57/00
U.S. Cl. 108—96 10 Claims



1. A suspended shelving unit for hanging a set of shelves downwardly along a wall from a hook assembly at adjustable spacing intervals comprising in combination, at least two shelves each having an edge disposable away from said wall and a wall engaging edge and defining a first set of apertures for receiving a first flexible line at the wall engaging edges and a second set of apertures for receiving a second line at the edge away from said wall, a first line fed through the first apertures at the wall engaging edges and looped about the shelf edge at each aperture to support and space the shelves a predetermined distance apart forming a generally parallel relationship to the wall, a second flexible line fed through the second set of apertures and looped about the shelf edge at each edge away from said wall to support and space the shelves said predetermined distance apart, a hook assembly engaging both lines at their uppermost extremities with said second line defining an acute angle with said wall toward the uppermost shelf thereby to provide a force by weight of the shelves on said second line tending to hold the shelves against the wall, whereby the loops of said flexible lines about said shelves may be rearranged to change said predetermined distance between adjacent shelves.

4,187,788

TUFTING MACHINE

James T. Cobble, Dalton, Ga., assignor to B & J Machinery Company, Inc., Dalton, Ga.

Filed Oct. 26, 1978, Ser. No. 954,937
Int. Cl.² D05C 15/00
U.S. Cl. 112—79 R 24 Claims

1. A tufting machine for forming pile fabric or the like, and characterized by relative pivotal movement between its components as opposed to relative sliding movement, to thereby minimize frictional resistance and the need for lubricating oil, and comprising

means for feeding an elongate backing fabric longitudinally along a predetermined path,

an elongate needle bar extending in a direction transverse to the path of the backing fabric, and mounting a longitudinal row of spaced tufting needles which are adapted to carry yarns through the backing fabric,

means for mounting said needle bar and needles for reciprocation in a direction transverse to the path of the backing material and such that the needles cyclically penetrate and withdraw from the backing fabric, said reciprocating means comprising

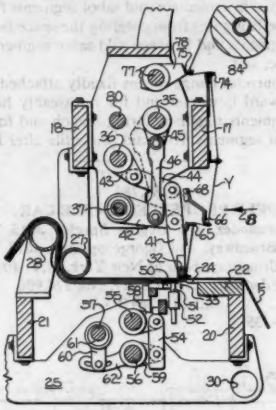
(a) a push rod arm having one end fixed to said needle bar and extending therefrom in a direction generally perpendicular to the backing fabric,

(b) a first mounting arm having one end pivotally connected to said push rod arm and extending in a direction generally transverse therefrom, and a second end pivotally connected to a first support member,

(c) a support mounting arm having one end pivotally connected to said push rod arm and extending in a direction generally transverse therefrom, and a second end pivotally connected to a second support member,

(d) means operatively connected to said push rod arm for cyclically reciprocating the same in a direction toward and away from said backing fabric and as controlled by the pivotal movement of said first and second mounting arms, and resulting in a corresponding reciprocation of said needle bar and needles, and

looper mean disposed on the side of said backing fabric opposite said needle bar and operatively associated with each of said needles for forming rows of tufts in the moving backing fabric from the yarns carried by said needles.



4,187,789

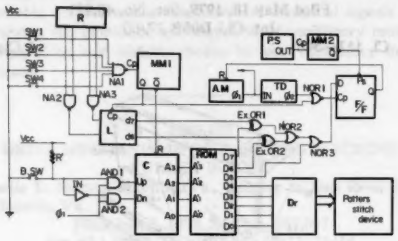
SEWING MACHINE WITH AN ELECTRONIC PATTERN STITCH CONTROL SYSTEM

Hideaki Takenoya, Hachioji, and Machiro Makabe, Fussa, both of Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Apr. 4, 1978, Ser. No. 893,359
Claims priority, application Japan, Apr. 4, 1977, 52/37516
Int. Cl.² D05B 3/02
U.S. Cl. 112—158 E 4 Claims

1. In a cyclically operating sewing machine, in combination, a static pattern memory having address inputs, data outputs and comprising a plurality of addressable storage locations storing pattern data for the constituent stitches of a plurality of selectable patterns; user-operated pattern-selector means operative when the user selects one of the selectable patterns for generating a pattern-identifying signal identifying the pattern thusly selected; addressing means connected to the address inputs and operative for addressing successive storage locations of the pattern memory by the application of successive address signals to the address inputs of the memory at a frequency greater than the frequency of the cycles of machine operation, whereby to cause the pattern data stored in successive storage locations of the memory to be produced at the data outputs of the memory, and including comparing means con-

nected to the data outputs of the memory and to the pattern-selector means and operative for comparing the data successively produced at the data outputs of the memory against the pattern-identifying signal to automatically ascertain whether the data at the data outputs does or does not belong to the selected pattern and, if the data does not belong to the selected pattern, causing the addressing to continue until data which



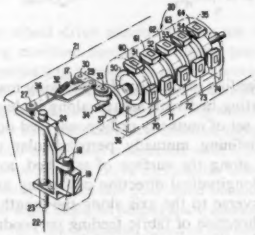
does belong to the selected pattern is produced at the data outputs, whereby during individual cycles of machine operation successive address signals are applied to the address inputs at high speed until data which does belong to the selected pattern appears at the data outputs; and stitching-forming means connected to the data outputs and responding to the data produced at the data outputs.

4,187,790

STEPPER DISK ADDER FOR PATTERN STITCH SEWING MACHINES

John D. Vogel, Brecksville, Ohio, assignor to The Singer Company, New York, N.Y.

Filed Apr. 4, 1979, Ser. No. 27,117
Int. Cl.[2] D05B *3/02*; F16H *21/44*
U.S. Cl. 112—158 E **12 Claims**



1. A stepper disk adder comprising:

a plurality of adjacent, rotatable, disk like rotors having a common longitudinal axis of rotation;

each rotor having at least a pair of opposite polarity magnetic poles spaced apart on the periphery thereof;

a pair of spaced apart magnetic field producing coils located adjacent the periphery of each said rotor;

threaded means having an axis of rotation along said longitudinal axis threadedly coupling adjacent rotors to one another; and

a source of actuating signals coupled to each said pair of magnetic field producing coils;

each said source of signals including means to alternately actuate the coils in at least some of the pair of coils to cause the associated rotor to oscillate between a first and second position whereby at least some of the plurality of rotors reciprocate along said longitudinal axis by way of said threaded means.

4. The stepper disk adder according to claim 2 further including:

a sewing machine having a frame;

stitch-forming instrumentalities in said frame;

an actuating mechanism for imparting stitch-forming movement to said stitch-forming instrumentalities;

control linkage in said sewing machine frame operatively associated with said stitch-forming instrumentalities for selectively influencing the production of a variety of patterns of stitches; and

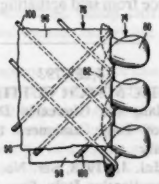
means connecting the rotor at the other end of said plurality of adjacent rotors that is not restrained from reciprocating along said longitudinal axis to said control linkage.

4,187,791

METHOD OF MANUFACTURING SLIDE FASTENER STRINGERS

George B. Moertel, Conneautville, Pa., assignor to Textron Inc., Providence, R.I.

Division of Ser. No. 648,428, Jan. 12, 1976, Pat. No. 4,100,656, which is a continuation-in-part of Ser. No. 539,642, Jan. 9, 1975, Pat. No. 3,975,802. This application Feb. 15, 1978, Ser. No. 878,094
Int. Cl.[2] D05B *3/18*; A44B *19/40*
U.S. Cl. 112—265.2 **26 Claims**



1. A method of forming a stringer for a slide fastener comprising

cutting a row of spaced transverse slits in a strip along a longitudinal section intermediate the edges of the strip;

applying a row of reinforcing sections of fiber on one side of the strip transversely across the intermediate longitudinal section of the strip;

assembling a continuous coupling element onto the one side of the strip such that head portions of the continuous coupling element protrude from the respective slits on the other side of the strip and such that interconnecting portions of the coupling element between successive head portions extend on the one side of the strip under strap portions of the strip defined between the slits; and

folding the strip longitudinally along the intermediate section such that the strap portions and the reinforcing sections of fiber form loops around the interconnecting portions.

4,187,792

THREAD TRIMMER

Ronald J. Boser, Dix Hills, N.Y.; Walter P. Siegel, Lebanon, N.J., and Michael F. Picciotti, Jackson Heights, N.Y., assignors to Union Special Corporation, Chicago, Ill.

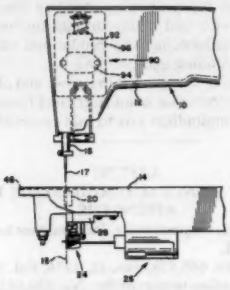
Filed Mar. 27, 1978, Ser. No. 890,346
Int. Cl.[2] D05B *65/00*
U.S. Cl. 112—286 **6 Claims**

1. A thread severing assembly means or use with a sewing machine assembly comprising:

a thread severing means including an actuating means, a cutter means having a housing means, a supporting means securing said housing means to said sewing machine assembly, a stripper means and a picker-knife means carried by said housing means and capable of movement with respect thereto and a means operative for transfering force

to said stripper means and said picker-knife means from said actuating means;

a thread tensioning means having an actuating means, means operative for periodically immobilizing a portion of thread means and means operative for transfering force



from said actuating means to said immobilizing means; said

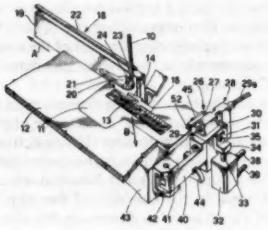
a thread wiper means having an actuating means, means operative for wiping said thread and means operative for transfering force from said actuating means to said wiping means.

4,187,793

AUTOMATIC STITCH CUTTING DEVICE

Emilio Fietta, Milan, and Giancarlo Della Torre, Biassono (Monza), both of Italy, assignors to Rockwell-Rimoldi, S.p.A., Milan, Italy

Filed Jul. 31, 1978, Ser. No. 929,380
Claims priority, application Italy, Sep. 22, 1977, 27829 A/77
Int. Cl.[2] D05B *65/06*
U.S. Cl. 112—288 **6 Claims**



1. A device for controlling a chain of stitches when starting a seam in a sewing machine of the type having at least one stitch forming needle and feed mechanism defining the sewing axis and a needle plate with an integral tongue on which the chain of stitches is formed with a chain cutter mounted adjacent the needle plate for receiving the chain formed on the tongue, sad controlling device comprising:

(a) an orienting element (23) mounted on the machine for removing a chain of stitches severed from a workpiece from the chain cutter and extending the same in a generally forwardly direction,

(b) a slide block (30) mounted on the machine forwardly of the feed mechanism with means for effecting vertical sliding movement thereof which includes:

(i) a suction intake element (28) for receiving the severed end of the chain positioned by said orienting element;

(ii) a clamping device (26) for receiving and gripping the chain adjacent said suction intake element; and

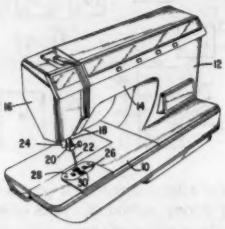
(iii) a cutting means (54–55) operatively associated with said suction intake element for severing that portion of the chain extending from the latter to said clamping device.

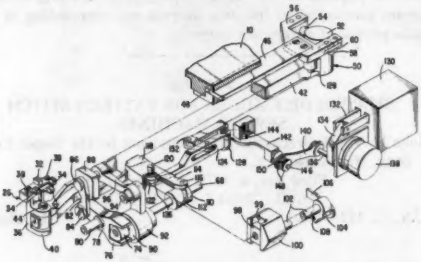
4,187,794

SEWING MACHINE WORK FEEDING MECHANISM

Roger J. Ross, Mont St-Gregoire, Canada, and Edward J. Tullman, Union, N.J., assignors to The Singer Company, New York, N.Y.

Filed May 18, 1979, Ser. No. 40,021
Int. Cl.[2] D05B *27/00*
U.S. Cl. 112—308 **7 Claims**





1. A work feeding mechanism for a sewing machine having a work supporting bed with an axis along its length, a throat plate having a set of mutually orthogonal feed dog accommodating slots defining mutually perpendicular directions of work feeding along the surface of said bed, said directions comprising a longitudinal direction of feeding extending in a direction transverse to the axis along the length of said bed, and a lateral direction of fabric feeding perpendicular to said longitudinal direction, an elongated feed bar carried beneath said bed and extending substantially along the length of said work supporting bed, a feed dog pivotally supported at one extremity of said feed bar and having a set of mutually orthogonal work engaging teeth positioned to be accommodated within said feed dog accommodating slots,

gimbal means fastened to said feed bar and supporting the extremity of said feed bar opposite the extremity having said feed dog pivotally fastened thereto to permit said feed dog to be driven in said longitudinal direction transversely across said bed and in a direction above and below said throat plate,

slidable means constrained to said bed to slide along a line extending parallel to the axis of said bed,

means fastened to said slidable means for suspending said gimbal means from said slidable means,

a feed bar drive mechanism operable in timed relation to said sewing machine for imparting oscillations to said feed bar about said gimbal means in mutually perpendicular directions, including said longitudinal direction transversely across said bed to provide work advancing and return move-

ments to said feed dog, and in said direction above and below said throat plate to raise said feed dog to a position above said throat plate during work advancing movement and to drop said feed dog below said throat plate during the return movement thereof,

means driven by said feed bar drive mechanism for imparting oscillatory motion to said slidable means along said axis along the length of said bed, and

adjustable control means responsive to electrical signals for varying the amplitude and direction of oscillatory motion impated to said slidable means by said oscillatory drive means.

4,187,795

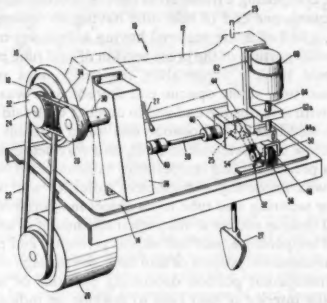
DRIVE MECHANISM FOR A SEWING MACHINE PULLER WHEEL

Charlie L. Norton, Danville, Va., assignor to Dan River Inc., Danville, Va.

Filed Jan. 5, 1978, Ser. No. 867,097

Int. Cl.[2] D05B *27/10, 27/04, 27/12, 27/14*

U.S. Cl. 112—318 **4 Claims**



1. A puller wheel drive mechanism for use in association with a sewing machine having a pedestal provided with a horizontally projecting arm spaced above a work surface sufficiently to allow unobstructed movement beneath said arm of material being sewed, said arm supporting a reciprocable needle and presser foot assembly at a distance from the pedestal and a horizontal main shaft connected with a motor to drive said needle assembly, said drive mechanism comprising:

(a) a variable speed gearbox positioned behind said pedestal having an input shaft, an output shaft, and external control means to vary the rotational speed of the output shaft with respect to the rotational speed of the input shaft;

(b) toothed endless belt and pulley means drivingly connecting said input shaft to said main shaft;

an idler puller wheel rotatably mounted at the level of said work surface and behind said reciprocable needle assembly;

(d) a yoke assembly having a driven puller wheel disposed above said idelr puller wheel;

(e) second drive means drivingly connecting said output shaft to said driven puller wheel comprising horizontal flexible shaft means connected at one end with said output shaft of the gearbox and supported at the other end by said yoke assembly at a distance above said work surface sufficiently to allow unobstructed movement of sewed material beneath said shaft, and toothed endless belt and pulley means drivingly connecting said driven puller wheel with the other end of said shaft and

(f) pneumatic means to raise and lower said yoke assembly including said driven puller wheel independently of said reciprocable presser foot assembly.

4,187,796

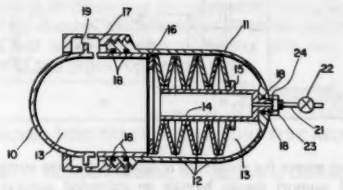
SPECIFIC GRAVITY EQUALIZER SYSTEM

John O. Ess, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 591,210, Jun. 27, 1975, abandoned. This application Dec. 29, 1977, Ser. No. 865,752

Int. Cl.[2] B63G *8/00*

U.S. Cl. 114—312 **11 Claims**



1. A system for maintaining the specific gravity of a submersible vessel at approximately the same specific gravity at any depth as the specific gravity of the fluid medium in which the vessel is immersed comprising:

a plurality of fluid-activated means carried in said vessel, each fluid-activated means comprising:

a casing,

movable enclosure means mounted at one end of and within said casing, said movable enclosure means having a cylindrical end and a semispherical end, said semi spherical end exposed to pressures of said fluid medium with said cylindrical end lying within said casing and forming with said casing a closed chamber,

a fluid in said closed chamber at normal pressure,

biasing means within said closed chamber for acting against said movable enclosure means to cause it to oppose an inward pressure of said fluid medium, the normal pressure in some of the fluid-activated means being different for operation of said fluid-activated means at different pressure levels of the surrounding medium so that, when the depth of the fluid medium is divided into a series of consecutive depth ranges, the biasing means in each fluid-activated means will exhibit a pressure vs volume characteristic which is roughly the same as the pressure vs volume characteristic of the external fluid medium over the range of depths for which the container is designed,

fluid-sealing means mounted to seal against passage of fluid along the contact area between said casing and said movable enclosure means so that none of the fluid medium can enter into said closed chamber and fluid under pressure cannot leak from said closed chamber, the pressure in said fluid medium, when it is higher than the pressure in said closed chamber, acting to force the movable enclosure means inward to proportionately decrease the volume of the closed chamber so as to increase the vessel's specific gravity, and the pressure in said chamber when it is higher than the pressure in said fluid medium, acting to force the movable enclosure means outward to proportionately increase the volume of the closed chamber so as to decrease the vessel's specific gravity.

4,187,797

THRESHOLD PLATE DOOR ALARM

Walter W. Hoinski, Norristown, Pa., assignor to Power Systems Development Corporation, Wilmington, Del.

Filed Apr. 20, 1978, Ser. No. 898,422

Int. Cl.[2] G08B *13/08*

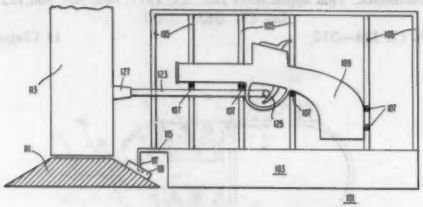
U.S. Cl. 116—87 **9 Claims**

1. A door threshold alarm apparatus for use in combination with a door and the threshold plate thereof, comprising:

elongated means for sensing door movement, said sensing means being in contact with said door when closed;

an alarm component operatively connected to said sensing means;

anchoring means attachable to said door threshold plate; and



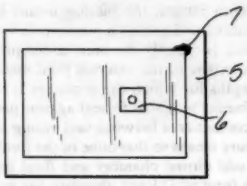
support means for securedly holding said alarm component, said support means having an extended portion being slidably connectable to and removeable from said threshold plate anchoring means, for selectively securedly positioning said alarm component at a predetermined spacing from said door when closed.

4,187,798

METHOD OF DETECTING DEFECTIVE PORTION OF SEALING

Tetsuya Yoshimura, Yokohama, Japan, assignor to Nagatanien Honpo Co., Ltd., Tokyo, Japan

Filed Apr. 17, 1978, Ser. No. 896,888
Claims priority, application Japan, Jun. 29, 1977, 52-76576
Int. Cl.[2] B65B *31/02*; G01N *31/22*
U.S. Cl. 116—206 **5 Claims**



1. A method of detecting a defective sealed portion of a sealed container, said method comprising the steps of:

(a) injecting into a sealed container a colored detection liquor consisting essentially of a coloring material giving color to said liquor and a liquid organic compound, said liquor having a surface tension lower than that of water and a permeability into small clearances greater than that of water such that the surface tension and permeability properties of said liquor permit said liquor to exude into a defective sealed portion of the sealed container;

(b) resealing the container where the colored detection liquor was injected; and

(c) inspecting said container for the presence of colored detection liquor, whereby a defective sealed portion of said sealed container may be detected by the visible presence of colored detection liquor in the area of a defective sealed portion.

4,187,799

TEMPERATURE INDICATOR

Andrew A. Zwarun, Albertson, N.Y., assignor to Propper Manufacturing Co., Inc., Long Island City, N.Y.

Filed Apr. 21, 1978, Ser. No. 898,789
Int. Cl.[2] G01K *11/06*
U.S. Cl. 116—217 **1 Claim**

1. A temperature indicator for providing a permanent indication that a given predetermined temperature has been reached, comprising a transparent tube of substantially uniform cross-section, one end of said tube having an opaque coating thereon, a ball of dense material having a diameter occupying a substantial portion of the cross-section of said tube positioned within said tube, a temperature responsive wax positioned within said tube at the opaque end thereof, said wax being in contact with said opaque end and in contact with said ball so as to retain said ball at said opaque end when ambient temperature is below a predetermined level, said wax being adapted to melt at a predetermined temperature releasing said ball, a dye in said wax imparting a distinctive color to said wax, and means for securing said tube to an object in operative position with said opaque end up so that, upon attainment of said predetermined temperature, said ball moves promptly and positively into the transparent portion of said tube, the passage of said ball in said transparent portion depositing portions of said dyed wax on the interior of said tube to provide an indication that said temperature has been attained.

4,187,800

DEVICE FOR MANUFACTURING PHOTOSENSITIVE SCREEN

Toshio Nakatsubo; Masaji Nishikawa, both of Hachioji, and Eiichi Sato, Tama, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 12, 1977, Ser. No. 796,481
Claims priority, application Japan, May 18, 1976, 51-56015
Int. Cl.[2] C23C *13/08*
U.S. Cl. 118—724 **4 Claims**

1. A device for manufacturing a photosensitive screen comprising a vacuum vapor deposition means for forming on a mesh-shaped electrically conductive substrate a photosensitive layer by vapor deposition under vacuum in said means, said vapor deposition means comprising a vapor supply source, means for supporting said mesh-shaped electrically conductive substrate above said vapor supply source along at least one portion of a circular plane having a center located at said vapor supply source, and a bell jar, said vapor supply source being

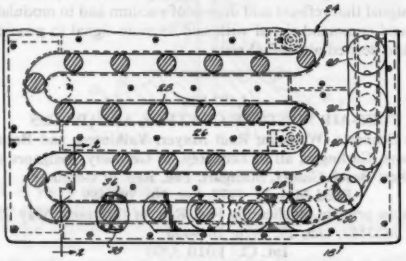
arranged substantially at the center of said bell jar, said mesh-shaped substrate being supported by the supporting means substantially in the form of a cylinder with its surface to be vapor deposited facing inwards and rotatably supported about the center of the cylinder as a horizontal rotational axis.

4,187,801

METHOD AND APPARATUS FOR TRANSPORTING WORKPIECES

Gaines W. Monk, Alexandria, Va., assignor to Commonwealth Scientific Corporation, Alexandria, Va.

Filed Dec. 12, 1977, Ser. No. 859,965
Int. Cl.[2] C23C *11/00*
U.S. Cl. 118—729 **14 Claims**



1. An apparatus for transporting workpieces along a closed, non-circular path in a treatment chamber for treatment which alters a surface of the workpieces, comprising:

a plurality of workholders for each mounting at least one workpiece;

means defining said closed non-circular path for guiding movement of said workholders along said path including a base plate along which said workholders slide in direct contact with said plate for effective heat transfer;

means for controlling the temperature of said base plate; and

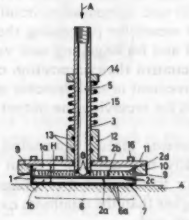
means for engaging said workholders to drive said workholders along said path and rotating each of said workholders about its axis during movement along said path so that all of the workpieces follow the same path and are treated identically.

4,187,802

DEVICE FOR APPLYING FLOWING MASSES TO THE SURFACE OF A WORKPIECE

Max Thimm, Rhienscher Berg 10, D-5810 Witten, Fed. Rep. of Germany

Filed Sep. 23, 1977, Ser. No. 837,045
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1976, 2643279; Sep. 14, 1977, 2741239
Int. Cl.[2] B05C *1/00*
U.S. Cl. 118—708 **6 Claims**



1. A device for applying flowing masses, such as pastes or viscous liquids, to the surface of a workpiece, comprising a hollow chamber containing the mass, a conduit for conveying said mass to said hollow chamber and an outlet in said hollow chamber turned to the surface of the workpiece, wherein: a piston (2) having passages therethrough is arranged in the hollow chamber (1), through the front side (2*a*) of which piston (2) the mass is forced toward the outlet (6), the front side (2*a*) of the piston is parallel to the outlet (6), the surface of the outlet (6) is subdivided into several openings (6*a*) and slots; and said conduit (5) conveying the mass is formed by a longitudinal boring in piston rod (3) and transverse borings (8) are arranged in the piston rod (3) adjacent the rear side (2b) of the piston (2), said borings (8) connecting the longitudinal boring to that part (1*a*) of the chamber which is positioned on the rear side of the piston, said hollow chamber containing only said piston, a portion of said piston rod, and said mass.

4,187,803

PROCESS FOR PELLETIZING SORPTIVE MINERAL FINES

Rudolph C. Valenta, Elmhurst, Ill., assignor to Oil-Dri Corporation of America, Chicago, Ill.

Division of Ser. No. 668,637, Mar. 19, 1976, Pat. No. 4,036,928, which is a continuation of Ser. No. 170,270, Aug. 9, 1971, abandoned. This application May 16, 1977, Ser. No. 797,544
The portion of the term of this patent subsequent to Jul. 19, 1994, has been disclaimed.
Int. Cl.[2] A01K *1/015*
U.S. Cl. 119—1 **7 Claims**

1. In a process utilizing absorbent pellets for the purpose of absorbing liquids and then handling or disposing of such liquids through the medium of such pellets, said pellets being identified by the process of manufacturing the same, which said latter process takes sorptive mineral fines having open pore spaces and including fine particles that will pass through a 20 mesh screen to make pellets which have a liquid absorption capacity substantially equal to that of said fines, said manufacturing process for said pellets comprising mixing said fines with water to moisten the same and substantially fill said open pore spaces with water, then forcing said moistened fines through a die in pelletizing apparatus to compactly form the moistened fines into a coherent mass of material while avoiding the forcing of water from said pore spaces, cutting said coherent mass of material to form pellets, and the step of evaporating the water from said pellet pore spaces to render said pore spaces open for subsequent absorption of liquid when it is applied to said pellets,

said utilizing process comprising the steps of bringing together said absorbent pellets produced from said fines and a liquid to be absorbed, permitting said pellets to absorb said liquid, and thereafter handling the pellets in a manner which takes care of said liquid absorbed thereby.

4,187,804

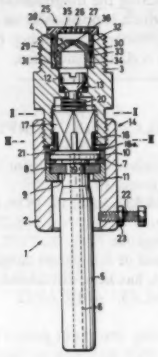
WATER DISPENSER FOR LIVESTOCK

Rainer von Taschitzki, Cologne, Fed. Rep. of Germany, assignor to Aratowerk Walter von Taschitzki, Cologne, Fed. Rep. of Germany

Filed Jul. 21, 1977, Ser. No. 817,600
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1976, 2632734; Jun. 2, 1977, 7717393[U]
Int. Cl.[2] A01K *7/00*
U.S. Cl. 119—72.5 HRC **8 Claims**

1. A water dispenser for livestock, said dispenser comprising a casing, said casing being tubular and having a connecting portion at one end for attachment to a water line, said casing having an axial bore therethrough opening into said connecting portion for receiving water therefrom, a valve seat surrounding said bore, an axially movable valve member cooperable with said valve seat for closing said bore, a foot member connected to said valve member and disposed in said bore beyond said valve seat, a resilient member constantly resiliently urging said valve member toward said valve seat, a hollow mouthpiece extending axially out of said casing remote

from said connecting portion, mounting means mounting an end portion of said mouthpiece in said casing in sealed relation to said bore for receiving water therefrom and for tilting relative to said casing axis, said mouthpiece having a relatively large radially outwardly directed flange adjacent said mounting means, said casing having a support ledge receiving said flange and forming a fulcrum for said mouthpiece, said foot member having a relatively large radially outwardly directed flange adjacent and engageable by said mouthpiece flange to



axially shift said foot member and said valve member to an unseated position in response to tilting of said mouthpiece, a first ring insert defining said support ledge a second ring insert carried by said casing and having seated thereon the first ring insert, said second ring insert having a second ledge spaced from the support ledge, and said mounting means including a flexible annular member carried by said mouthpiece in sealed relation, and an outer portion of said flexible annular member being clamped between said ledges in sealed relation to said casing.

4,187,805

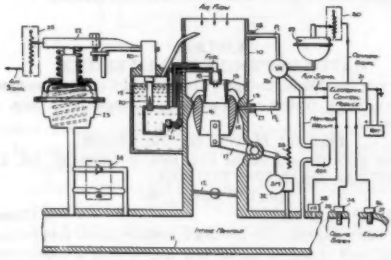
FUEL-AIR RATIO CONTROLLED CARBURETION SYSTEM

Harold G. Abbey, 11 Goldsmith Dr., Holmdel, N.J. 07733

Continuation-in-part of Ser. No. 919,541, Jun. 27, 1978. This application Nov. 22, 1978, Ser. No. 962,883

Int. Cl.[2] F02M *9/14*

U.S. Cl. 123—28 **17 Claims**



12. An automatic control system for supplying a fuel-air mixture to the inlet of the intake manifold of the internal combustion engine of a vehicle for regulating the ratio of air to fuel so that this ratio is optimized for prevailing conditions of engine speed and load, said system comprising:

A. a variable Venturi structure whose input is coupled to a source of combustion air and whose output is coupled to the inlet of said intake manifold, said structure including a throat and a mechanism to adjust the effective area thereof;

B. a signal-responsive closed process control loop including a servo motor coupled to said mechanism to adjust the effective area of said Venturi throat;

C. means to sense the velocity of air passing through said Venturi structure to produce an air velocity command signal which is applied to the input of said loop to cause said servo motor to effect an adjustment in accordance therewith;

D. means including a metering valve to feed fuel into said Venturi structure to be intermixed with said air therein;

E. means to adjust said valve in accordance with the degree of vacuum in said intake manifold; and

F. means responsive to the valve adjustment to produce a signal that reflects said degree of vacuum and to modulate said command signal with said vacuum signal to provide the desired air-to-fuel ratio.

4,187,806

FUEL-AIR MIXTURE CONTROL APPARATUS

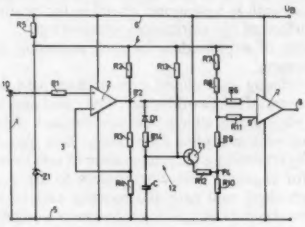
Hans Schnurle, Walheim; Rudi Mayer, Vaihingen, and Bernd Kraus, Gerlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 23, 1977, Ser. No. 799,489

Claims priority, application Fed. Rep. of Germany, May 22, 1976, 2623113; Oct. 29, 1976, 2649456

Int. Cl.[2] F02B *3/00*

U.S. Cl. 123—32 EE **10 Claims**



1. An apparatus for controlling the composition of the combustible mixture supplied to an internal combustion engine, said engine including variable means for fuel supply and an exhaust system, and said apparatus including an oxygen sensor in said exhaust system, an oxygen sensor circuit including the oxygen sensor for generating an electrical signal related to the composition of said combustible mixture, said signal having a defined upper and lower limit which occur as a function of the oxygen content of the engine exhaust gas, said limits increasing in amplitude with decreasing temperature of said sensor, a comparator circuit for comparing said electrical signal with a variable threshold signal, a detector circuit for receiving the output from said oxygen sensor, a threshold signal adjusting circuit connected to said comparator circuit and said detector circuit, and circuit means for processing the output from said comparator circuit and for engaging said variable fuel supply means to thereby control the composition of the combustible mixture, the improvement in said detector circuit comprising:

a detector circuit for receiving the output from said oxygen sensor and

a set-point generator circuit connected to said detector circuit; whereby said detector circuit engages said set-point generator to maintain the voltage of said set-point signal to be higher than the minimum oxygen sensor signal

a charging circuit; and

discharging means connected thereto and responsive solely to the lower limit of said oxygen sensor signal for causing an adjustment of said threshold adjustment circuit thereby maintaining the voltage of the threshold signal to be

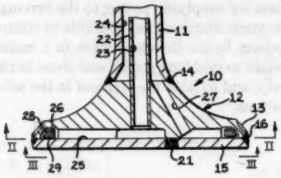
higher than the lower limit of the signal generated by the oxygen sensor circuit.

4,187,807

COOLED ENGINE VALVE WITH IMPROVED HEAT TRANSFER

Richard A. Cemenska, Edelstein, and Alexander Goloff, East Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 22, 1978, Ser. No. 879,843
Int. Cl.[2] F01P *3/14*
U.S. Cl. 123—41.34 **18 Claims**



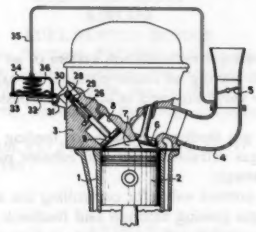
1. A valve comprising
an elongated stem,
a head disposed at an end of said stem and defining an annular valve face thereon
circulating means in said valve for circulating a coolant therethrough, including an inlet passage, an outlet passage and annular chamber means defined in said head to communicate with said inlet and outlet passages and disposed closely adjacent to said valve face, and
agitating means disposed in said chamber means for vibrating therein during valve operation for forcing oil back and forth in said chamber means for improving heat transfer from said valve face to said coolant.

4,187,808

ENGINE HAVING A VARIABLE COMPRESSION RATIO

Guy Audoux, Adainville par Conde sur Vesgres, France, assignor to Automobiles Peugeot and Societe Anonyme Automobiles Citroen, both of Paris, France

Filed Jul. 10, 1978, Ser. No. 923,106
Claims priority, application France, Jul. 11, 1977, 77 21259
Int. Cl.[2] F02B *75/04*
U.S. Cl. 123—48 AA **5 Claims**



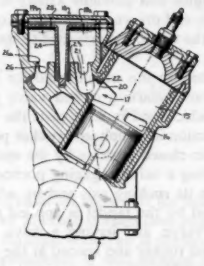
1. A cylinder-type explosion engine having a variable compression ratio and comprising for each of the cylinders thereof, a cylinder head defining with the cylinder a combustion chamber, a cavity in the cylinder head and opening onto the combustion chamber, an auxiliary piston provided with a piston rod and movable in said cavity, the cavity defining with the auxiliary piston an annular chamber around said rod, a passageway communicating with said annular chamber for connection to a source of liquid under pressure, a check valve in said passageway, the rod of the auxiliary piston having a wall defining an axial bore therein, a slide valve member slidable in said bore, means for controlling the position of the slide valve member in said bore in accordance with a parameter which represents the conditions of operation of the engine, at least one throughway escape port in said wall defining the bore of the rod so as to constitute a liquid discharge path for said chamber, the slide valve member being cooperative with said escape port, a second cavity of smaller diameter than the cavity for the auxiliary piston and extending the cavity for the auxiliary piston, a second auxiliary piston fixed to a free end of the rod of the auxiliary piston and movable in said second cavity, said two cavities being defined by two bores, a shoulder between said two bores, a partition wall which is in bearing relation to said shoulder and separates said two cavities, said rod of the auxiliary piston extending through said partition wall, the auxiliary pistons and the partition wall defining with said cavities and the rod of the auxiliary piston two chambers escape ports in said rod of the auxiliary piston respectively putting the two chambers in communication with the bore of the rod of the auxiliary piston, the second auxiliary piston defining in said second cavity a chamber communicating with the fluid return conduit, an actuting rod extending the slide valve member and defining a shoulder which defines an operative portion of the slide valve member.

4,187,809

EXHAUST SYSTEM FOR MULTIPLE CYLINDER TWO-STROKE ENGINES

Richard A. Lanpheer, and David W. Kusche, both of Oshkosh, Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Sep. 12, 1977, Ser. No. 832,197
Int. Cl.[2] F02B *77/00*; F01N *7/08*
U.S. Cl. 123—65 EM **13 Claims**



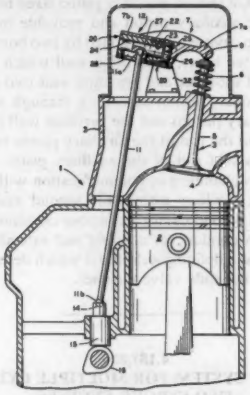
1. A two stroke internal combustion engine having at least three cylinders comprising:
(a) an exhaust means having an exhaust cavity therein,
(b) individual exhaust port means connected to each cylinder and to said exhaust means including
(1) a port at the wall of a cylinder and
(2) an outwardly projecting wall means defining a chamber as an extension of said port, said wall means terminating in said exhaust cavity, and
(c) exhaust pulse transmission wall means connected to the projecting wall means and connecting the port means of an exhausting cylinder and the port means of a charging cylinder and said transmission wall means including a pulse transmission passageway of a proper length to cause the exhaust pulse from an exhausting cylinder to arrive at the exhaust port means of a charging cylinder prior to the complete closing of the exhaust port whereby the air-fuel mixture which escaped from the exhaust port of the charging cylinder which is within the exhaust port means is forced back into the charging cylinder prior to the closing of said exhaust port.

4,187,810

POPPET VALVE STROKE ADJUSTING DEVICE FOR, AND COMBINATION WITH, AN INTERNAL COMBUSTION VALVE IN HEAD ENGINE

Joseph F. Buehner, 6750 State Rd., Wadsworth, Ohio 44281

Filed Feb. 17, 1978, Ser. No. 878,800
Int. Cl.[2] F01L *1/34*
U.S. Cl. 123—90.16 10 Claims



1. A valve stroke control device for an overhead poppet valve internal combustion engine having a removable head, a poppet valve mounted in the head, a return spring for returning the valve from open to closed position, a timing gear train, a rotatable cam driven by the train, a reciprocable tappet carried by the engine and movable axially in opposite directions, respectively, and driven by the cam in one of said directions for opening the valve, and returned to starting position by the return spring;

a rocker mounted on the engine head for rocking about a fixed axis from a starting closed valve position, in one direction in which said rocker opens the valve, and in an opposite direction in which said rocker permits returning of the valve to closed position by the spring;

said rocker having a valve engaging portion spaced a fixed distance from its rocking axis and by which the driving force imparted by the tappet is applied to the valve for opening the valve, and having a drive force receiving portion on said rocker and spaced at the opposite side of the rocking axis from the valve engaging portion;

adjustment means fixedly mounted on said force receiving portion of the rocker for rocking therewith and including an adjustment element movable relative to the rocker transversely of said rocking axis in opposite directions from a long stroke position spaced a predetermined distance from said rocking axis to a short stroke position which is a different distance from said rocking axis than said predetermined distance;

an elongated push rod;

first connecting means connecting one end of the rod to the driving end of the tappet so that the rod is driven by the tappet in the valve opening direction, and so that the rod is swingable about said one end as a center toward and away from said rocker axis;

additional connecting means connecting the other end of the push rod to said element for movement of said other end with the element in said opposite directions for swinging the rod transversely of its axis about said one end of the rod by the element, to said long stroke and short stroke positions, respectively, of said element and for concurrent movement of the rod along the rod axis with the element in said long stroke and short stroke positions, respectively, as the element rocks with the rocker in each of said positions;

said adjustment means further including driving means for driving said element in said opposite positions, selectively, independently of the rotated position of said cam and for holding the element in the selected one of the positions, thereby to move said other end of the rod to said long stroke and short stroke positions, selectively;

said element being arranged so that said starting position of the valve is the same in both said long stroke and short stroke positions of the element and rod and while the timing relation between the cam and the initation of valve opening remains unchanged; and

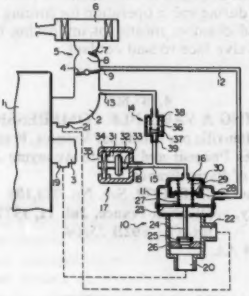
power means for supplying power to the driving means, and remotely controllable means operable to control the delivery of power to the driving means in a manner to drive said element to said long stroke and short stroke positions, selectively, and to hold the element in the selected one of said positions.

4,187,811

EXHAUST GAS RECIRCULATION SYSTEM OF AN INTERNAL COMBUSTION ENGINE

Kenji Katoh, and Tamotu Ogita, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 14, 1978, Ser. No. 915,560
Claims priority, application Japan, Nov. 7, 1977, 52-132463
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A 7 Claims



1. An exhaust gas recirculation system of an internal combustion engine having an intake passage, an exhaust passage and a throttle valve disposed in said intake passage, comprising:

an exhaust gas feedback passage for feeding a part of the exhaust gas extracted from said exhaust passage to said intake passage;

a feedback control valve for controlling the amount of the exhaust gas passing through said feedback passage, said feedback control valve being actuated so as to pass the exhaust gas therethrough when the absolute level of the vacuum pressure fed from a first vacuum port opening into said intake passage at a position adjacent to said throttle valve exceeds a set level;

an atmospheric pressure sensing means for generating a pressure signal when the level of the atmospheric pressure is lowered to less than a predetermined level, and;

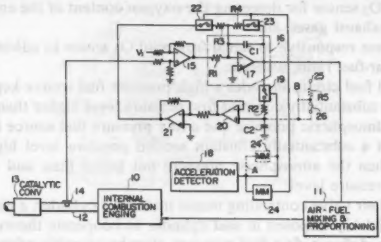
a correcting means for decreasing said set level for actuating said feedback control valve, in response to said pressure signal generated by said atmospheric pressure sensing means.

4,187,812

CLOSED LOOP FUEL CONTROL WITH SAMPLE-HOLD OPERATIVE IN RESPONSE TO SENSED ENGINE OPERATING PARAMETERS

Akio Hosaka, Yokohama, and Shigeo Aono, Seki, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 12, 1977, Ser. No. 815,049
Claims priority, application Japan, Jul. 13, 1976, 51/82568
Int. Cl.[2] F02M 7/00
U.S. Cl. 123—119 EC 15 Claims



1. A closed loop fuel control system for an internal combustion engine including means for supplying air and fuel thereto at a variable ratio and exhaust means, comprising:

means for sensing the concentration of a predetermined constituent of the gases in said exhaust means and sensing the deviation of the air-fuel ratio within said exhaust means from a reference value to provide a correction signal to said air-fuel supplying means;

means for detecting a variation of an operating condition of said engine;

means for sampling said correction signal in response to the detection of said variation of said engine operating condition and storing said sampled signal, said storing means having a characteristic of decreasing the value of the stored signal as a function of time so that said stored signal assumes a value corresponding to an average value of the correction signal generated when said engine operating condition is varied; and

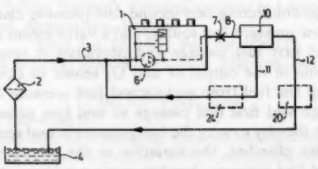
means for providing said stored signal to said air-fuel supplying means in response to the detection of a subsequent variation of said engine operating condition.

4,187,813

FUEL SUPPLY DEVICE

Gerhard Stumpp, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 6, 1978, Ser. No. 894,210
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1977, 2715587
Int. Cl.[2] F02B 77/00; F02M 31/00
U.S. Cl. 123—136 6 Claims



1. In combination with a fuel injected internal combustion engine having a fuel injection pump, a fuel feed pump and a fuel tank, a fuel temperature control system comprising:

means connecting said fuel feed pump to supply fuel from said tank to the inlet of said fuel injection pump;

fuel relief conduit means including throttle means connected to said fuel injection pump; and

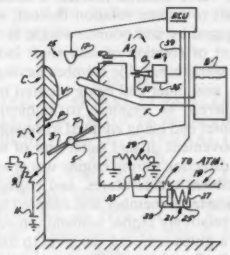
temperature controlled valve means operable in response to fuel temperature connected between the outlet of said throttle means and at least said tank and operable to conduct fuel from said throttle means to said fuel tank if the fuel temperature is above a predetermined value and to block flow to said tank if the fuel temperature is below said predetermined value.

4,187,814

ALTITUDE COMPENSATION APPARATUS

Michael B. Phelan, and Jack M. White, both of Florissant, Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Feb. 16, 1978, Ser. No. 878,244
Int. Cl.[2] F02M 11/00
U.S. Cl. 123—119 EC 8 Claims



1. Altitude compensation apparatus for use with a carburetion system for an internal combustion engine, said system having a passage through which air is drawn into said engine, a throttle valve positioned in said passage and movable between an open and a closed position to control the flow of air therethrough and a fuel circuit through which fuel is delivered to said passage for mixing with air to form an air-fuel mixture combusted in said engine, the apparatus comprising:

means for sensing the position of said throttle valve and for supplying an electrical signal representative thereof;

means for sensing the flow rate of air through said passage and for supplying an electrical signal representative thereof;

means for sensing the vacuum level in said engine and for supplying an electrical signal representative thereof;

means for metering the quantity of fuel supplied by said fuel circuit to said passage thereby to maintain the air-fuel ratio of the mixture produced at a preselected value; and

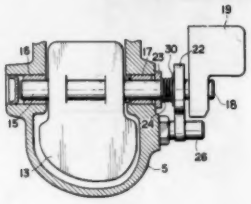
means responsive to the aforesaid signals for calculating the density of air being drawn into said engine and for generating a control signal which is supplied to said metering means to control the metering of fuel thereby, the air density calculated by said signal responsive means being a function of the altitude at which said engine is operated and said control signal having characteristics which are a function of the calculated air density.

4,187,815

INTAKE FUEL MIXTURE HEATING SYSTEM FOR INTERNAL COMBUSTION ENGINE

Toshihiko Kobayashi, and Toshinari Oonishi, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jun. 6, 1978, Ser. No. 913,053
Claims priority, application Japan, Mar. 27, 1978, 53/34105
Int. Cl.[2] F02M *31/00*
U.S. Cl. 123—122 H **6 Claims**



1. A system for heating the intake fuel mixture of an internal combustion engine having an intake manifold comprising means for delivering exhaust gases of said internal combustion engine into heat exchange relationship with said intake manifold to heat intake fuel mixture flowing therethrough, a valve for controlling flow of said exhaust gases, a rotatably mounted shaft having said valve secured thereto, a counterweight secured to said shaft to induce rotation thereof, stopper means located to be engaged by said counterweight in order thereby to limit the extent of rotation of said shaft induced by said counterweight, a spiral bimetallic member having an inner end and an outer end, said inner end being secured to said shaft to effect rotation thereof in response to ambient temperature conditions, said outer end being adapted to engage said stopper means to limit movement of said outer end of said bimetallic member in a first direction during engine warm up condition at relatively low ambient temperatures, and engagement means secured to said bimetallic member and adapted to engage said stopper means at relatively higher ambient temperature conditions in excess of a given temperature level to limit movement of said outer end of said bimetallic member in a direction opposite to said first direction.

4,187,816

AIR-FUEL RATIO CONTROLLING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Masaharu Sumiyoshi; Setsuro Sekiya; Katsuhiko Motosugi, all of Toyota; Junzo Uozumi, Nagoya; Tsuneo Ando, Chiryu; Yuzo Takeuchi, and Mikio Minoura, both of Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Aisan Industry Co., Ltd., Ohbu, both of, Japan

Filed Jul. 10, 1978, Ser. No. 923,307
Claims priority, application Japan, Jul. 20, 1977, 52-87156
Int. Cl.[2] F02M *39/00*; F02B *33/00*
U.S. Cl. 123—139 AW **3 Claims**

1. An air-fuel ratio controlling system for an internal combustion engine having an intake duct with a throttle valve disposed therein, said system comprising:

an air valve disposed in said intake duct upstream of said throttle valve to cooperate therewith to define an air pressure chamber therebetween;

an air valve controlling means responsive to variation in the air pressure in said air pressure chamber normally to maintain a substantially constant air pressure difference across said air valve;

a fuel circuit having at its downstream end a fuel discharge port open to said intake duct;

a fuel metering means including means defining a fuel-metering variable orifice disposed in said fuel circuit and means for maintaining a substantially constant fuel pressure difference across said fuel-metering variable orifice;

said fuel-metering orifice defining means being operatively associated with said air valve so that the fuel-flowing area of said fuel-metering orifice is varied in proportion to the variation in the air-flowing opening area defined between said air valve and said intake duct;

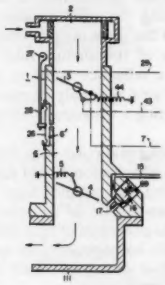
said air valve controlling means and said fuel metering means being cooperative to control the air-fuel ratio of an air-fuel mixture to be fed into the engine such that the air-fuel ratio is normally kept substantially constant;

an O_2 sensor for detecting the oxygen content of the engine exhaust gases; and

means responsive to signal from said O_2 sensor to adjust the air-fuel ratio; wherein:

said fuel circuit includes a high pressure fuel source kept at a substantially constant first pressure level higher than the atmospheric pressure and a low pressure fuel source kept at a substantially constant second pressure level higher than the atmospheric pressure but lower than said first pressure level;

said air valve controlling means includes a cylinder, a piston slidably disposed in said cylinder to cooperate therewith to define a first fuel pressure chamber capable of being communicated with said high and low pressure fuel



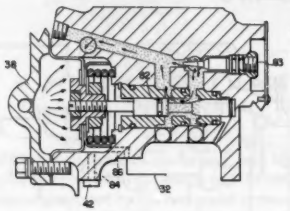
sources, a link means operatively connecting said piston to said air valve, a bore and a spool slidable in said bore and having a valve portion, said spool being movable in said bore in response to variation in the pressure in said air pressure chamber to cause said valve portion to control the communication between said first fuel pressure chamber and said high and low pressure fuel sources thereby to vary the pressure in said first fuel pressure chamber; and

said O_2 sensor responsive means includes a second fuel pressure chamber defined by the cooperation of said bore and one end of said spool and communicated through a first restriction with said high pressure fuel source, a first fuel passage connecting said second fuel pressure chamber to said low pressure fuel source, and a valve means disposed in said first fuel passage and operative in response to variation in the output of said O_2 sensor to control the flow of the fuel from said second fuel pressure chamber through said first fuel passage to said low pressure fuel source thereby to vary the fuel pressure in said second fuel pressure chamber, the variation in the pressure in said second fuel pressure chamber moving said spool to vary the pressure in said first fuel pressure chamber so that said piston is moved to vary the degree of opening of said air valve and thus vary the air pressure difference across said air valve whereby the air-fuel ratio is adjusted.

4,187,817
APPARATUS AND METHOD FOR AVERTING THE EFFECTS OF SEAL FAILURE IN AN I.C. ENGINE FUEL SUPPLY SYSTEM

Harry L. Wilson; David E. Shultz, and George L. Muntean, all of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Oct. 5, 1978, Ser. No. 948,872
Int. Cl.² F02M *39/00*; F02D *1/04*; F02B *77/00*; F16K *31/365*
U.S. Cl. 123—139 AW **23 Claims**



1. A fuel supply system for an internal combustion engine which is operationally controlled by the pressure of fuel supplied to the engine from a fuel source and which has an intake manifold for supplying air to the engine, comprising

(a) air pressure responsive means for modulating mechanically the flow of fuel into the engine in response to the pressure of air within the intake manifold, said air pressure responsive means including

(1) first and second chambers,

(2) pressure responsive actuating means disposed between said chambers for normally preventing fluid flow between said chambers and for transforming changes in intake manifold pressure operating said air pressure responsive means, and

(3) an air line connecting said intake manifold with said first chamber;

(b) fuel leakage drain means for returning fuel which may leak into said second chamber back to the fuel source, said fuel leakage drain means including a drain line connected to form a return path from said second chamber to the fuel source; and

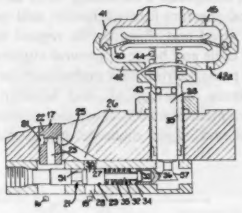
(c) flow restriction means connected with said air line for permitting air flow in both directions between the intake manifold and said first chamber and for preventing substantially all flow of fuel from said air pressure responsive means to the air intake manifold, whereby restriction or blockage of said drain line cannot cause substantial flow of fuel from said air pressure responsive means to the intake manifold even if said pressure responsive actuating means were to malfunction and permit fuel to flow from said second chamber into said first chamber.

4,187,818
FUEL INJECTION PUMPING APPARATUS FOR INTERNAL COMBUSTION ENGINES INCLUDING MANIFOLD PRESSURE DEVICE

Ronald Phillips, Northolt, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Jul. 19, 1978, Ser. No. 926,121
Claims priority, application United Kingdom, Sep. 15, 1977, 38467/77
Int. Cl.² F02D *1/06*
U.S. Cl. 123—140 R **6 Claims**

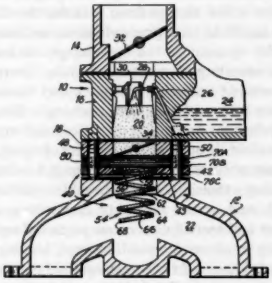
1. A fuel injection pumping apparatus comprising an injection pump operable to deliver fuel in timed relationship with an engine to which fuel is supplied by the apparatus, a feed pump for supplying fuel under pressure to the injection pump, valve means for controlling the output pressure of the feed pump so that it varies in accordance with the speed at which the apparatus is driven, an operator adjustable throttle means for varying the quantity of fuel supplied to the injection pump, a valve disposed in the fuel flow path between the feed pump and the injection pump, said valve including a valve element which is subjected to the outlet pressure of the feed pump to urge the valve element in a direction to reduce the throttling effect of the valve, means responsive to the pressure of air supplied to the engine, an abutment movable by said last-mentioned means and engagable by a part connected to said valve element, said abutment being shaped so that with an increase in the pressure of air supplied to the engine, the valve element is moved to reduce the throttling effect of the valve, and pre-stressed resilient means interposed between said valve member and said part whereby at low engine speeds the movement of the valve element is determined solely by the means responsive to the air pressure and at a predetermined higher engine speed the output pressure of the feed pump acts to move the valve element against the action of the resilient means, in a direction to reduce the throttling effect of the valve.



4,187,819
FRUSTO-CONICAL, SPIRAL FUEL ECONOMIZATION AND POLLUTION REDUCTION DEVICE FOR USE WITH CARBURETORS OF INTERNAL COMBUSTION ENGINES

Roberto Longobardi, Viale Europa 2/E, Castellammare di Stabia, Prov. Naples, Italy

Filed Jan. 26, 1978, Ser. No. 872,627
Claims priority, application Italy, Apr. 5, 1977, 48838 A/77; France, Sep. 27, 1977, 77 28983
Int. Cl.² F02M *29/00*
U.S. Cl. 123—141 **5 Claims**



1. In a fuel economization and pollution reduction device for use with the carburetor of an internal combustion engine having an intake manifold, the improvements comprising, a frusto-conical spiral mixing element having an unobstructed, generally frusto-conical flow passage extending therethrough, and means to mount said element in the fuel-air mixture passage from the carburetor to the intake manifold with the axis of said element being in general alignment with the axis of said passage whereby, the fuel-air mixture from said carburetor will

flow through said element and a vortex-like or whirling motion will be thereby imparted to said fuel-air mixture to further admix the same said frusto-conical spiral mixing element extending into said intake manifold whereby, contact by said fuel-air mixture with the heated walls of said manifold, and attendent heating thereby of said mixture, will be reduced due to the centripetal forces generated within said mixture by said vortex-like motion, said frusto-conical spiral mixing element comprising a plurality of coils of decreasing diameter in the direction of flow of said fuel-air mixture, and wherein said mounting means comprises a mounting body having a generally frusto-conical aperture formed therein, said aperture being complementally sized and shaped with regard to the largest diameter of said coils and being in general alignment with the fuel-air mixture passage from said carburetor for the flow of said fuel-air mixture therethrough, and wherein said frusto-conical mixing element is mounted in said mounting body by the disposition of said largest diameter coil in said aperture.

4,187,820

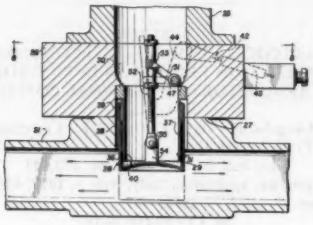
INTAKE MANIFOLD VARIABLE ATOMIZING VALVE

Sherwood F. Webster, 7832 Via Marina, Scottsdale, Ariz. 85258, and Richard L. Heise, 133 E. Garfield, Tempe, Ariz. 85281

Filed Oct. 11, 1978, Ser. No. 950,470

Int. Cl.[2] F02M *29/04*

U.S. Cl. 123—141 **12 Claims**



1. In an internal combustion engine having an intake manifold to receive a fuel charge from a carburetor for delivery through said manifold to engine cylinders, said manifold having a main inlet opening for the fuel charge, the improvement comprising a mounting element adapted for interposition between said manifold and said carburetor and having a bore in communication with said main inlet opening, a fixed sleeve on the mounting element depending therefrom and extending into the intake manifold through said main inlet opening, an atomizing screen assembly telescopically engaged with the fixed sleeve and being extensible and retractable relative thereto in said manifold, said screen assembly comprising a relatively rigid cage, first and second concentric screens fixed within the cage and being in circumferential contact, bearing means between the fixed sleeve and the screen assembly and maintaining a radial space around the fixed sleeve and between it and the innermost of said concentric screens, the innermost screen being relatively coarse mesh screen and the outermost screen being a finer mesh screen, and automatically variable resistance biasing means connected with the screen assembly and resiliently urging it toward a retracted position on the fixed sleeve and yielding in response to the increased demand of an engine for fuel and increasing engine speeds to allow automatic gradual extension of the screen assembly on the fixed sleeve to progressively uncover greater screen areas through open spaces of said cage relative to the fixed sleeve.

4,187,821

INTERNAL COMBUSTION ENGINE WITH A BYPASS LINE SKIRTING THE LOAD-CONTROL ORGAN OF THE INTERNAL COMBUSTION ENGINE

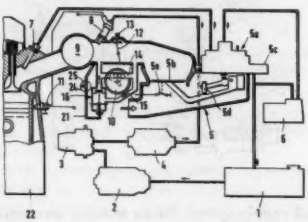
Roland-Detlev Zebli, Stuttgart, Fed. Rep. of Germany, assignor to Dr. Ing. h.c. F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 3, 1978, Ser. No. 874,937

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1977, 2704456

Int. Cl.[2] F02N *17/00;* **F02M** *7/00, 1/10*

U.S. Cl. 123—179 G **3 Claims**



1. In an internal combustion engine of the type having an air supply line for supplying air to a combustion chamber, a load-regulating member disposed in said supply line, a bypass line extending in bypassing relationship to said load-regulating member from a position upstream of said load-regulating member to a position downstream thereof, and an auxiliary air valve disposed in said bypass line, said auxiliary air valve having a valving member connected to and movable with a membrane which is displaceable under action of the suction pressure in said air supply line to control air flow through said bypass line, the improvement comprising:

a valve line interconnecting said air supply line and one side of said membrane, a condition responsive valve means located in said valve line, said condition responsive valve means being shiftable from a first position communicating said one side of the membrane with the atmosphere to retain said valving member in a position opening said bypass line and a second position communicating said one side of the membrane with said air supply line to obtain said displacement under action of the suction pressure in said air supply line and means for shifting said condition responsive valve means between said first and second positions for opening said auxiliary air valve during a warm operating phase of the engine.

4,187,822

LIQUID FUEL PUMPING APPARATUS

John Craven, and Thomas H. M. Reilly, both of London, England, assignors to Lucas Industries Limited, Birmingham, England

Filed Feb. 10, 1978, Ser. No. 876,940

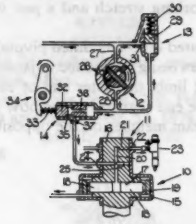
Claims priority, application United Kingdom, Nov. 25, 1977, 49084/77

Int. Cl.[2] F02N *17/00;* **F02M** *39/00*

U.S. Cl. 123—179 L **6 Claims**

1. A liquid fuel pumping apparatus for supplying fuel to an internal combustion engine and comprising an injection pump operable in use, in timed relationship with an associated engine, a feed pump for supplying fuel under pressure to the injection pump, valve means operable to control the outlet pressure of the feed pump in a manner so that it increases with speed, an adjustable throttle for varying the rate of fuel supply to the injection pump from the feed pump, a cylinder, a piston in said cylinder, conduit means through which one end of said cylinder communicates with the outlet of the feed pump so that one end of the piston is subject to said pressure, resilient means operable at low engine speeds to oppose movement of the

piston by said pressure, the position of said piston determining the setting of the throttle, and a bimetal member responsive to the temperature within a housing part of the apparatus, the apparatus in use being mounted in close proximity to the engine so that the temperature within the housing part is repre-



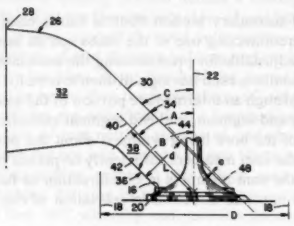
sentative of the temperature of the engine, said bimetal member being positioned between the piston and the resilient means so that the force generated by the fuel under pressure acting on the piston is transmitted to the resilient means through the bimetal member.

4,187,823

HIGH SWIRL INLET PORT

William L. Brown, Jr., Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 3, 1978, Ser. No. 883,103
Int. Cl.² F01L *3/00*
U.S. Cl. 123—188 M **7 Claims**



1. In an internal combustion engine which comprises at least one cylinder bore and a corresponding number of generally circular inlet valves, each of said valves opening to a head of a respective cylinder bore, each of said valves having a periphery thereof substantially tangent to said respective cylinder bore and each of said valves having an axis thereof substantially parallel to an axis of said respective cylinder bore, an improved swirl-type air flow entry passage configuration, comprising:

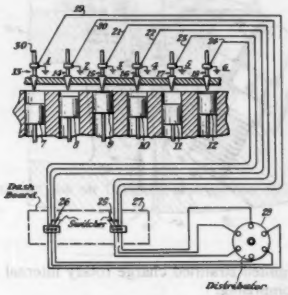
a generally straight duct serving as said air flow entry passage to deliver air to said valve, said duct leaving said valve at such an angle that a centerline of said duct forms an angle, A, of 30° to 50° with said valve axis, an inner wall of said duct, which comprises that portion of said duct nearest to the cylinder bore, forms an angle, B, of at least about 40° with said valve axis and an outer wall of said duct, which comprises that portion of said duct farthest from the cylinder bore, forms an angle, C, of 30° to 50° with said valve axis, said duct having a generally circular or oval cross-section, said outer wall if extended in the direction of air flow clearing, on the inside, a seat of said valve.

4,187,824

ELECTRICAL FUEL CUT OFF SWITCH

Joseph C. Connolly, 871 SW. 64th. Ave., North Lauderale, Fla. 33063

Filed Dec. 19, 1977, Ser. No. 861,634
Int. Cl.² F02D *17/00*
U.S. Cl. 123—198 F **2 Claims**



1. In a fuel injected internal combustion engine in a vehicle with a control board adjacent the driver, the injected internal combustion engine including solenoid valves distributing fuel under pressure to the engine cylinders of the internal combustion engine which engine cylinders have a prescribed firing order, at least one solenoid valve connected to each engine cylinder, the solenoid valves and the engine cylinders are divided into at least a first bank and a second bank of different solenoid valves and engine cylinders, and the injected internal combustion engine includes a solenoid valve control distributor with electrical lines connecting said distributor between the solenoid valves and the electric power, said distributor sequentially supplies electrical power to each solenoid valve for opening and closing each solenoid valve, a manual switching device for the driver that is easily and selectively used to cut off fuel to each particular bank of different solenoid valves and engine cylinders comprising:

a plurality of manual switching means including at least a first manual switching means and a second manual switching means for disconnecting and connecting electrical power to said solenoid valves, said switching means for controlling fuel to the engine cylinders and placement adjacent the driver for manual operation by the driver,

said switching means connected in said electric lines, said first manual switching means for connecting and disconnecting electrical power in said electrical lines connected solely to said first bank to prevent fuel flow, and

said second switching means for connecting and disconnecting electrical power in said electrical lines connected solely to said second bank to prevent fuel flow,

a first electrical connecting means for separately connecting said solenoid valves in said first bank to said distributor solely through said first switching means, and

a second electrical connecting means for separately connecting said solenoid valves in said second bank to said distributor solely through said second switching means, whereby the fuel to said first bank of engine cylinders is controlable separately and apart from the fuel to said second bank of engine cylinders.

4,187,825

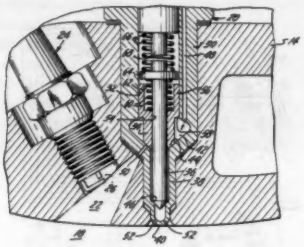
PILOT FUEL IGNITED STRATIFIED CHARGE ROTARY COMBUSTION ENGINE AND FUEL INJECTOR THEREFOR

Robert W. Loyd, Jr., Wyckoff, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Division of Ser. No. 842,472, Oct. 17, 1977, abandoned. This application Dec. 4, 1978, Ser. No. 966,074

Int. Cl.[2] F02B *53/10*

U.S. Cl. 123—205 7 Claims



1. A pilot-ignited stratified charge rotary internal combustion engine comprising:

(a) housing having a cavity therein;

(b) a rotor supported for planetary rotation within the cavity and defining with the housing a plurality of working chambers which successively expand and contract in volumetric size as the rotor and housing rotate relative to each other;

(c) an inlet port and an exhaust port for respectively passing at least air into the working chambers and gaseous products of combustion from the working chambers;

(d) a fuel injector having spaced first and second nozzle means and sequentially operable valves for controlling fuel flow therethrough;

(e) said injector being connected to a source of pressurized fuel so that fuel flows through each nozzle means when said valves are operable to an open position;

(f) a passage in said housing for communicating said first nozzle means with the working chambers;

(g) an opening in said housing for communicating said second nozzle means with the working chambers so that fuel is substantially directly emitted into the working chamber when its associated valve opens; and

(h) ignition means in the passage to ignite the fuel-air mixture therein so that the burning fuel passing from the passage into the working chamber ignites the fuel-air mixture in the working chamber.

4,187,826

FOLDING LIMB COMPOUND ARCHERY BOW

Gerald I. Killian, 16016 SE. 82nd Dr., Clackamas, Oreg. 97015

Filed Apr. 15, 1977, Ser. No. 787,860

Int. Cl.[2] F41B *5/00*

U.S. Cl. 124—24 R 9 Claims

1. A compound archery bow comprising:

(a) a handle member,

(b) a pair of bow limbs projecting from opposite ends of the handle member and terminating in a tip to receive a bow string,

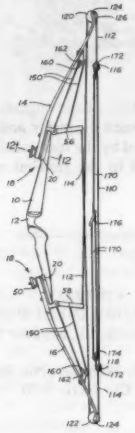
(c) a hinge means pivotally joining each limb to the handle in a manner allowing movement of the limbs between an operative position extending outwardly of the handle and a folded position inwardly adjacent of the handle wherein said tip lies on the same side of and adjacent to the belly of said handle member,

(d) releasable latching means interengaging the handle and limbs for securing the limbs to the handle member releasably in their operative position, said latching means being quickly releasable for permitting said limbs to be folded about their respective hinge means to said folded position inwardly adjacent said handle,

(e) a pair of cam members pivotally mounted eccentrically one adjacent the outer end of each limb,

(f) a bow string for projecting an arrow, the bow string extending between the cam members and forming an intermediate working stretch and a pair of opposite end segments,

(g) a pair of elongated levers mounted pivotally on the bow, each of the levers being positioned adjacent the inner end of its associated limb, the outer end of each lever being connected to the end segment of the bow string which is secured to the cam member on the opposite limb, and



(h) a pair of secondary tension control cables each operatively interconnecting one of the limbs and its associated lever and adjustable for pretensioning the associated limb,

(i) the cam members each having a diametric bore for receiving therethrough an intermediate portion of the associated bow string end segment, said end segment extending from each end of the bore being wrapped about the periphery of one of the cam members sufficiently to permit rotation of one of the cam members in one direction to full draw and in the opposite direction to relaxation of one of the limbs.

4,187,827

PROCESS FOR MULTIPLE LAP CUTTING OF SOLID MATERIALS

Dieter Regler, Burghausen; Erhard Sitrl, Marktl, and Alfred Moritz, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemitronic fur Elektronic Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed May 3, 1978, Ser. No. 902,514

Claims priority, application Fed. Rep. of Germany, May 20, 1977, 2722782

Int. Cl.[2] B28D *1/02*

U.S. Cl. 125—16 R 4 Claims

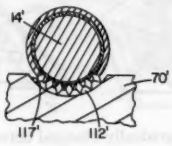
1. A process for the multiple lap cutting of solid semiconductor materials, using a set of parallel, spaced apart blades mounted on the frame of a gang-saw for reciprocal movement over the solid materials to be cut, in a suspension of a lapping abrasive, comprising the steps of

exerting a force of from 100 to 1000 gf per blade on the solid material;

maintaining the free working length of the blades between 110 to 250 mm, wherein the force applied to the blades is inversely proportional to the length of the blades; and

moving said blades through the solid material at a mean lateral speed of from 30 to 150 meters per minute.

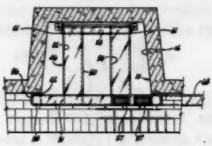
4,187,828
CUTTING
Frederick Schmid, Marblehead, Mass., assignor to Crystal Systems, Inc., Salem, Mass.
Continuation-in-part of Ser. No. 767,809, Feb. 11, 1977, Pat. No. 4,092,972. This application Mar. 13, 1978, Ser. No. 886,036
Int. Cl.² B28D *1/06*
U.S. Cl. 125—18 **12 Claims**



1. In a longitudinally-extending blade charged with abrasive particles, that improvement wherein:
said blade includes a longitudinally-extending abrasive-holding portion of metallic material having a hardness less than that of said abrasive particles and overlying a blade core of greater tensile strength;
said blade and said blade core are circular in transverse cross-section and said abrasive-holding portion comprises an annular layer overlying the peripheral surface of said core;
said abrasive holding portion defines a cutting surface extending between the opposite sides of said blade and defining less than one-half the total outer surface of said blade;
the thickness of said abrasive-holding portion is in the range of not less than about one-half the normal size of said particles to less than the nominal size of said particles; and
said particles are embedded into a longitudinally-extending segment of said cutting surface of said abrasive-holding portion but not into the sides of said blade, said longitudinally-extending segment into which said particles are embedded defining in transverse cross-section an arc of less than 180° whereby said particles do not project substantially beyond the sides of said blade.

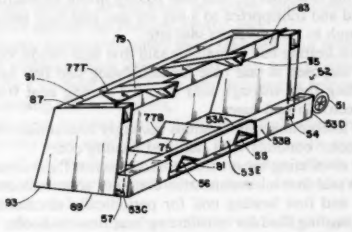
4,187,829
FIREPLACE HEAT EXCHANGER ASSEMBLY
Eugene E. Pauley, 45 Coral Dr., Belleville, Ill. 62221
Division of Ser. No. 692,570, Jun. 3, 1976, Pat. No. 4,103,669. This application Apr. 27, 1978, Ser. No. 900,658
Int. Cl.² F24B *7/00*; F24C *15/12*
U.S. Cl. 126—121 **6 Claims**

1. In a fireplace heat exchanger assembly:
(a) a conduit having an air inlet and an air outlet located outwardly of the fireplace, the conduit including:
1. a duct frame disposed externally at the top and sides of the fireplace, the air inlet and air outlet being located in the duct frame, and
2. a passage communicating with the duct frame and air inlet and extending rearwardly into the fireplace, and thence extending forwardly of the fireplace and communicating with the duct frame and air outlet, and
(b) blower means introducing air through the air inlet, into and through the duct frame, and passing the air through the passage and back into and through the duct frame, and



discharging the air from the duct frame through the air outlet.

4,187,830
FIREPLACE INSERT
Leon D. Creasey, 5750 Hoffman La., Fair Oaks, Calif. 95828
Filed Jan. 23, 1978, Ser. No. 871,194
Int. Cl.² F24B *7/00*
U.S. Cl. 126—121 **13 Claims**



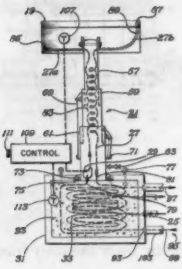
1. An air heating device for a fireplace comprising a hollow central section constructed and arranged to fit adjacent the rear wall of said fireplace in an upstanding manner, said central section having a front and rear wall, and two openings at the bottom of the front wall, and two openings at the top of the front wall thereof,
two side hollow sections each attached to said central section and in fluid communication therewith, each of said side sections having a front wall comprising top and bottom openings with a solid panel therebetween, and, an inside wall and an outside wall, thereby defining a generally U-shaped hollow chamber,
two lower air delivery tubes secured to the front wall of said central section at the bottom openings therein, said tubes being in fluid communication with said hollow central section,
whereby air will pass into the lower openings of each of said side sections and out of the top openings of each of said side sections, and air will enter said hollow chamber through said air delivery tubes;
two top air delivery tubes secured onto the front wall of said central section, one at each opening at the top of said front wall, each top air delivery tube being in fluid communication with the hollow chamber.

4,187,831

SELF CONTAINED SOLAR HEATING SUPPLEMENTAL UNIT

Marcus P. Eubank, P.O. Box 7576, Longview, Tex. 75601

Filed Jun. 21, 1978, Ser. No. 917,567
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—419 **10 Claims**



1. A self contained solar heating supplemental unit comprising:

a. at least one solar collector having at least one conduit through which a first heat conducting fluid can be circulated to carry away heat energy;

b. a mast carrying said solar collector above the surface of the earth;

c. a dual function base carrying said mast and said solar collector; said base having sufficient mass to serve as an anchor to keep said mast and collector upright and having sufficient mass and heat capacity to serve as a thermal storage unit for storing heat energy; said base having lifting means for being lifted and transported to a site for use; said base being small enough to be moved to said site;

d. a first heating coil containing said first heat conducting fluid and disposed in said base for circulating said first heat conducting fluid through said base for storing heat from said collector in said base;

e. first interconnecting conduits sealingly interconnecting said collector conduits with said first heating coil;

f. first circulating means interposed in series fluid connection with said first interconnection conduits, solar collector conduit and first heating coil for periodically circulating said first heating fluid for transferring heat from said solar collector to said base;

g. said first heat conducting fluid being disposed also in said first interconnecting conduits and said first circulating means;

h. insulation surrounding said base to minimize heat leakage therefrom; and

i. at least one second heat withdrawal coil disposed in said base and having connection means for connection with a second heat withdrawal circuit means and circulating a heat withdrawal fluid for withdrawing heat from said base.

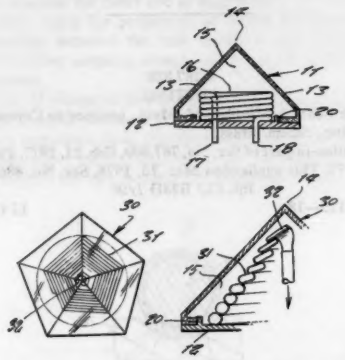
4,187,832

COSMIC AND SOLAR RAY HOT WATER HEATER

Robert H. Tregoning, 57 Foxon Hill Rd., East Haven, Conn. 06513

Filed Jun. 7, 1978, Ser. No. 913,577
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—443 **4 Claims**

1. A cosmic and solar ray hot water heater, comprising, in combination, a pentagonal-shaped container, mounted upon a base, and enclosing a tubular coil having an inlet and an outlet at opposite ends; said container being made of pyrex glass from five flat panels which are three times the thickness of ordinary window glass, and said container tapering upwardly at a 45 degree angle to an apex center; said coil being pentagonal in shape and tapering upwardly pyramidically to an apex; and said coil being circular in cross section at one end and flattened at its opposite end, and an entire length of said coil between



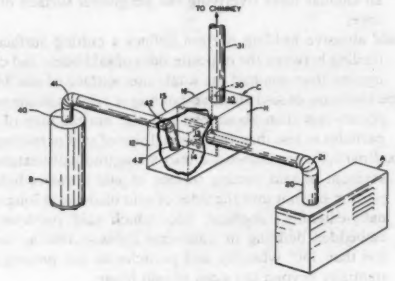
said ends being gradually changed between said circular and flattened configurations.

4,187,833

VENTING SYSTEM FOR GAS-FIRED HEATING PLANTS

Edward P. Zahora, and Edward Zahora, Jr., both of Naperville, Ill., assignors to Kinetics, Inc., Naperville, Ill.

Filed Apr. 19, 1978, Ser. No. 897,586
Int. Cl.[2] F23J 11/00; F23L 3/00
U.S. Cl. 126—312 **4 Claims**

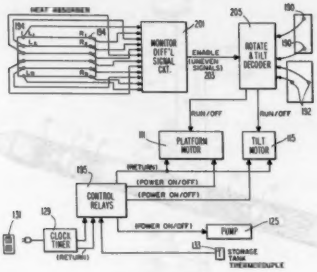


1. In combination with a first gas-fired heating plant, a second gas-fired heating plant, each of said plants having a combustion chamber and a chimney for receiving gaseous products of combustion from both said plants, the improvement comprising: a diverter box having an inlet end portion and an outlet end portion and having a partition between said portions, the bottom of said partition being above the bottom of said box to permit passage of gases from the inlet end portion to the outlet end portion while within the box, first conduit means for conducting gases from the combustion chamber of said first plant with the upper portion of said inlet end portion of said box, outlet conduit means for conducting gases from the upper portion of the outlet end portion of said box to said chimney, a second conduit means for conducting gases from the combustion chamber of said second plant to the upper portion of the inlet portion of said box and downwardly within said inlet end portion to about the level of the lower edge of said partition, the bottom of said box being open to the atmosphere surrounding said plants to thereby admit air and establish a pressure forming a heat lock to restrict the flow of air from the combustion chamber of said second plant through said first conduit means.

4,187,834
SOLAR HEATING SYSTEM

Walter W. Hoinski, Norristown, Pa., assignor to Power Systems Development Corporation, Wilmington, Del.

Filed Dec. 15, 1977, Ser. No. 860,707
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—425 14 Claims



1. In a solar heating system having a fluid conducting heat absorbing panel extending in a plane and mounted on a support for rotation in two directions, a lens system mounted in front of said panel for concentrating solar rays thereupon, and a storage tank for holding heated fluid, said tank being connected to said absorbing panel, the improvement comprising:

first means for rotating said absorbing panel in a first said direction, said first rotating means being attached to said support;

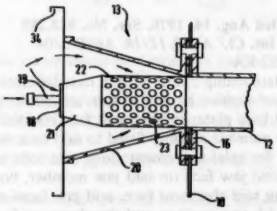
second means for rotating said absorbing panel in a second said direction, said second rotating means being attached to said support; and

means for controlling the operation of said first and second rotating means including a plurality of electrical heat sensitive monitors located upon said heat absorbing panel in the plane of said panel and a plurality of electrical heat sensors located apart from said heat absorbing panel in a plane perpendicular to the plane of said heat absorbing panel.

4,187,835
INDIRECT HEAT TRANSFER APPARATUS

Geoffrey L. Finney, Sutton Coldfield, England, assignor to Dunlop Limited, London, England

Filed Feb. 1, 1978, Ser. No. 874,317
Claims priority, application United Kingdom, Feb. 4, 1977, 4589/77
Int. Cl.[2] F24H 1/20
U.S. Cl. 126—360 R 14 Claims

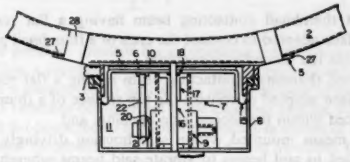


1. Indirect heat transfer apparatus in which fuel is progressively mixed with air in a high intensity burner assembly and burning gases are discharged directly into a tube of relatively smaller diameter immersed in a fluid to be heated whereby heat is transferred through the tube wall from the combustion gases to the fluid, and combustion air is admitted under pressure through a casing connected directly to the tube which at a position near the burner is of greater cross-sectional area than the tube but which progressively reduces in cross-sectional area toward the tube in such a way that the velocity of the combustion air is progressively increased between the burner and the tube, in a manner so that said velocity is low enough to provide flame stability at the burner but progressively increases in such a way that a higher proportion of the combustion takes place within the tube than within the casing.

4,187,836
FLOATING PISTON RESPIRATING PUMP

Richard T. Allen, Easton, Md.; Rudolph H. Moyer, West Covina, Calif.; Donald J. Sibbett, Cucamonga, Calif.; Howard H. Anderson, Covina, Calif.; Glen R. Martner, Rosemead, Calif., and Don Willis, Garden Grove, Calif., assignors to Geomet, Inc., Gaithersburg, Md.

Filed May 1, 1978, Ser. No. 901,653
Int. Cl.[2] G01N 1/22; A61B 5/02
U.S. Cl. 128—2.08 15 Claims



1. A floating piston respirating pump device adapted for support upon the thoracic cavity, which comprises in combination:

(a) a belt defining an enclosed air space, and adapted for support against the thoracic cavity; and,

(b) a pump housing mounted upon said belt, and including inlet means to allow ambient air to enter, and outlet means to allow ambient air to leave, said housing in response to a pumping action; wherein,

(c) said pump housing further includes a diaphragm which is movably supported therewithin to define, with an inner end of said housing, a free volume space, which space being communicated with the enclosed air space within said belt; and,

(d) a piston operably connected to said diaphragm, and movable within said housing upon movement of said diaphragm, to define a pumping chamber with an outer end of said housing, wherein when said free volume space is expanded, said piston defines a minimized pumping volume whereby, the expansion and contraction of the thoracic cavity, during respiration, is operable to actuate said piston within said housing to cause ambient air to enter and leave said housing; and,

(e) a linear counter means is further mounted within said housing, in operative connection to the piston, so as to count the piston movements within said housing, which movement being a function of respiration of one wearing said device.

4,187,837
FINGERNAIL STIMULATING APPARATUS

Joseph M. Braun, 1025 E. 13th N., Mountain Home, Id. 83647

Filed Oct. 16, 1978, Ser. No. 951,457
Int. Cl.[2] A61H 1/00
U.S. Cl. 128—32 8 Claims

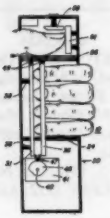
1. Fingernail stimulating apparatus comprising:

a substantially cylindrical housing adapted to be held in the palm of the hand, said housing having a first side opening operable to receive four fingers from a cupped hand and a second side opening oppositely disposed from the first side

opening, the second side opening operable to receive the thumb of the cupped hand;

a first fingernail contacting beam having a flat resilient surface adapted to contact the ends of fingernails placed within the first side opening;

a second fingernail contacting beam having a flat resilient surface adapted to contact the top surfaces of fingernails placed within the first side opening;



a first thumbnail contacting beam having a flat resilient surface adapted to contact the ends of a thumbnail placed within the second side opening;

a second thumbnail contacting beam having a flat resilient surface adapted to contact the top surface of a thumbnail placed within the second side opening; and

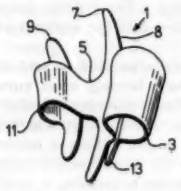
drive means mounted within said housing drivingly connected to said beams to vibrate said beams whereby the thumbnail and fingernails are stimulated.

4,187,838

EAR CLIP FOR FLATTENING OF PROTRUDING EARS

John Dubrowski, 515 Lakeshore Rd. West, Oakville, Ontario, Canada

Filed Aug. 15, 1977, Ser. No. 824,539
Int. Cl.[2] A61F *11/00, 5/01*
U.S. Cl. 128—76 R **5 Claims**



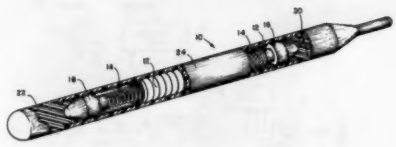
1. An ear clip for flattening of a protruding human ear, said ear clip being adapted to fit on an ear auricle of a human ear and comprising a resilient clip portion sized such that it may be clipped around the auricle helix of an ear auricle, a first elongated section having two ends, said first section being sized to fit against the inner surface of the auricle helix of an ear auricle, a second section sized to fit in the auricle concha of an ear auricle, said resilient clip portion being connected to said first section, between said ends such that first section will be positioned against the inner surface of the auricle helix of an ear auricle when said clip portion is clipped around the auricle helix of an ear auricle, a narrow bent section sized to fit over the auricle antihelix of an ear auricle, said bent section joining said first and second sections such that said second section will be positioned in the auricle concha of an ear auricle when said clip portion is clipped around the auricle helix of an ear auricle and said resilient clip portion being provided with hair securing means for flattening a protruding ear.

4,187,839

IMPLANTABLE PENILE PROSTHESIS

Elie S. Nuwayser, Wellesley, and James E. Barrington, Woburn, both of Mass., assignors to Abcor, Inc., Wilmington, Mass.

Filed Jun. 5, 1978, Ser. No. 912,327
Int. Cl.[2] A61F *5/00*
U.S. Cl. 128—79 **9 Claims**



1. A penile prosthesis adapted for surgical implantation in the penis for the treatment of erectile impotence, which penile prosthesis comprises:

(a) an elongated, tubular, gooseneck-type, shell element comprising a strip-wound material wherein the edges of adjacent strips are in a contacting relationship to provide internal friction to form the shell element sufficiently stiff in character to retain its position and which resists flexure, but which shell element may be overridden manually to overcome the resistance to flexure by lateral movement thereof;

(b) means at each end of the gooseneck-type shell element to protect such element; and

(c) an outer sheathing means surrounding the gooseneck-type shell element and integral with the end means to form a unitary integral penile prosthesis, whereby on implantation the penis may be moved from a flaccid penile position to an erect penile position through the user manually overcoming the resistance to flexure of the gooseneck-type element within the prosthesis.

4,187,840

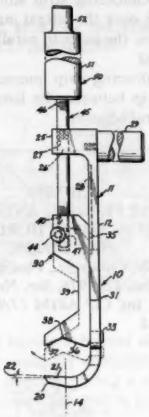
BONE PLATE CLAMP

Robert S. Watanabe, 321 Second St., Suite 1002, Los Angeles, Calif. 90012

Filed Aug. 14, 1978, Ser. No. 933,285
Int. Cl.[2] A61B *17/18;* **A61F** *5/04*
U.S. Cl. 128—92 EA **8 Claims**

1. A bone plate clamp comprising: a base member; a guideway on said base member having an axis; an abutment member carried by said base plate; an abutment face on said abutment member; a jaw member slidably fitted to said base member by said guideway for axial movement along said axis; a first jaw face and a second jaw face on said jaw member, both of said jaw faces facing said abutment face, said jaw faces making an obtuse angle with one another, and the abutment face making an acute angle with the normal to said axis; an internal thread in a passage through said base member, parallel to said axis; a leadscrew rotatably engaged to said thread and projecting from said base member at each end of said passage; releasable coupler means coupling the leadscrew to the jaw member for relative rotational movement and simultaneous axial movement; grip means on said leadscrew, said grip means having a

relatively larger diameter section and a relatively smaller diameter section, both exposed to be engageable by the hand; and a



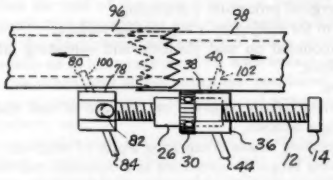
handle attached to the base member extending laterally therefrom on a side opposite from the jaw member.

4,187,841

BONE COMPRESSION OR DISTRACTION DEVICE

Richard A. Knutson, c/o Delta Orthopaedic Clinic, 130 N. Shelby St., P.O. Box 633, Greenville, Miss. 38701

Filed Jul. 7, 1978, Ser. No. 922,786
Int. Cl.[2] A61F *5/04*; A61B *17/18*
U.S. Cl. 128—92 E **16 Claims**



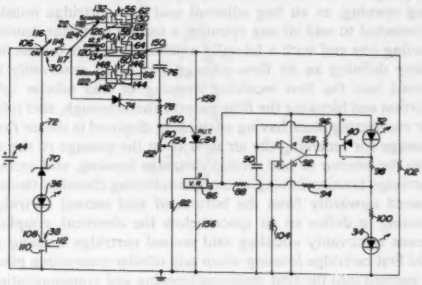
1. A bone compression or distraction tool, which comprises:
a threaded shaft;
a cap member secured to one end of said shaft, said cap member having at least one relatively short pin projecting therefrom;
a threaded sleeve rotatably engaged about said threaded shaft;
a knob means secured to and extending outwardly from said sleeve for enabling rotation of same and forming a shoulder; and
a pin carrying member removably fittable about said sleeve and having at least one relatively short pin projecting therefrom, one end of said pin carrying member being engagable by said shoulder so as to move towards or away from said cap member upon rotation of said knob means.

4,187,842

PRESSURE MONITOR FOR BREATHING SYSTEM

Peter J. Schreiber, Zionsville, Pa., assignor to N.A.D., Inc., Telford, Pa.

Filed Dec. 6, 1977, Ser. No. 858,041
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—202.22 **5 Claims**



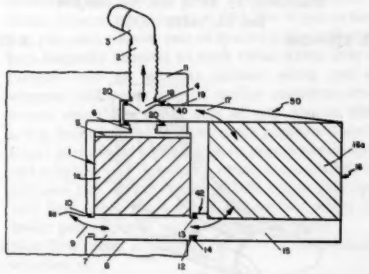
1. A pressure monitor for a breathing system, said monitor including a plurality of pressure responsive switches each of which is connected to pressure in said breathing system, each of said switches being preset to be changed in state when said switch is connected to a pressure which is in excess of a predetermined threshold pressure, each of said switches having a different predetermined threshold, said monitor further including signal means, timing means and selector means, said selector means connecting one of said switches at a time to said timing means, said timing means being responsive to said one selected switch and said signal means being connected to said timing means, said signal means being activated by said timing means whenever said system pressure does not exceed the threshold of said switch connected to said selector means within a predetermined time interval.

4,187,843

RESPIRATOR HAVING AN OXYGEN-RELEASING CHEMICAL CARTRIDGE AND MEANS FOR ATTACHING AN ADDITIONAL CARTRIDGE

Ernst Warncke, Lübeck, and Adalbert Pasternack, Bad Schwartau, both of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 19, 1978, Ser. No. 870,635
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1977, 2702673
Int. Cl.[2] A62B *7/08*
U.S. Cl. 128—202.26 **4 Claims**



1. A respirator comprising a respirator air hose having a mouthpiece connection at one end and an opposite end, a first cartridge housing having an oxygen-releasing chemical

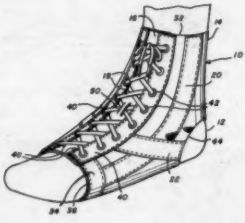
therein, said housing having a tubular inlet portion connected between and extending transversely to said air hose and said first cartridge housing with a through flow air passage therein from said air hose to said first cartridge housing, said tubular inlet portion having a first receiving opening intermediate the air passage, said first cartridge housing having a bottom wall spaced from the oxygen-releasing chemical with an air bag opening and a second receiving opening spaced from the air bag opening, an air bag adjacent said first cartridge housing connected to said air bag opening, a second cartridge housing having one end with a laterally extending tubular connecting piece defining an air flow passage and being removably inserted into the first receiving opening of said tubular inlet portion and blocking the flow passage therethrough, said tubular connecting piece having an opening disposed in the air flow passage for receiving the air flow from the passage of the air into the interior of said second cartridge housing, said second cartridge housing having an oxygen-releasing chemical therein spaced upwardly from the bottom of said second cartridge housing to define an air space below the chemical, coupling means removably coupling said second cartridge housing to said first cartridge housing when said tubular connecting piece is inserted into the first receiving opening and communicating in the air space below the oxygen-releasing chemical in the second cartridge housing with the space below the oxygen-releasing chemical in said first cartridge housing through said second receiving opening, said respirator being for swinging respiration in which respirator gases are exhaled through said air hose and through the air passage of said tubular inlet portion through the chemical of the first cartridge housing to the space in the first cartridge housing below the chemical and then to the air bag and flows in the reverse direction during inhaling when the second cartridge housing is not connected to said first cartridge housing, and when said second cartridge housing is removably connected to said first cartridge housing, the flow of respiratory gases during exhalation being from the air hose through the tubular connection of said second cartridge housing which blocks the flow passage to said first cartridge housing, and then to the second chemical in the second cartridge housing to the air space in the second cartridge housing below the chemical and through the coupling means to the air space below the chemical in the first cartridge housing and into the air bag and, during exhaling, with the flow being in the reverse direction, said tubular connecting piece of said second cartridge housing having an outer closed end which engages in said tubular inlet portion of said first cartridge housing and a top wall with an opening therethrough disposed in said air flow passage for receiving the air flow therethrough.

4,187,844

ANKLE SUPPORTER

Louis W. Caprio, Jr., 132 Eustis St., Revere, Mass. 02115

Filed Nov. 13, 1978, Ser. No. 959,998
Int. Cl.[2] A61F *13/06*
U.S. Cl. 128—166 **4 Claims**



1. An ankle supporter adapted to be fastened about a foot and ankle, comprising:

a flexible fabric sleeve having a lower peripheral edge and two facing edges,

means for fastening said facing edges together,

a longitudinal reinforcing strip stitched to a side of said sleeve, passing over the lateral malleolus of the foot and extending below the ankle to parallel the metatarsal bones of the foot, and

a transverse reinforcing strip intersecting said longitudinal reinforcing strip between the lateral malleolus and said lower peripheral edge.

4,187,845

APPARATUS FOR FEEDING ANESTHETIC AND/OR LIFE SUSTAINING GASES DURING A SURGICAL PROCEDURE

Leon L. Dror, 922 W. Culver St., Phoenix, Ariz. 85007

Filed Jul. 12, 1978, Ser. No. 923,899
Int. Cl.[2] A61M *17/00*
U.S. Cl. 128—205.13 **6 Claims**

1. An apparatus for feeding life sustaining gases to a patient during a surgical procedure comprising:

a platform for resting on a supporting surface,

a shaft mounted on said platform and extending laterally therefrom,

a bellows,

a supporting means mounted on one end of said shaft for holding a bellows,

said supporting means comprising a pair of relatively movable arms hingedly connected at a common end thereof, one of said arms being stationary to said shaft, the other of said arms being movable with respect to said one of said means,

said bellows being positioned between said arms and having means connectable at one point to a source of gas under pressure and having an outlet at another point for supplying gas under pressure,

pedal means hingedly mounted at one end thereof on said platform,

spring means connected to the free end of said pedal means for biasing said pedal means away from said platform, and

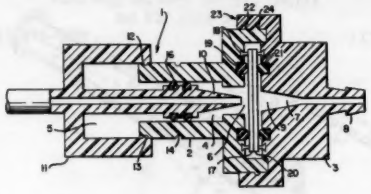
cord means connected to the free end of said pedal means at one end and to the free end of said other of said arms for pivotally moving said other of said arms relative to said one of said arms to selectively compress said bellows and to remove said pressure thereon upon pivotal movement of said pedal means.

4,187,846

STERILE CONNECTORS

Houshang Lolachi, Westport, Conn., and Robert N. Carminucci, Purdy, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jun. 22, 1978, Ser. No. 918,025
Int. Cl.[2] A61M 05/00
U.S. Cl. 128—214 R 24 Claims



1. A sterile connector having enhanced sterility protection and simplified operating capability comprising:

(a) a male connector member having a conduit extending therethrough, said conduit adapted to position a male luer fitting section therein;

(b) a female connector member having a conduit extending therethrough, said conduit comprising a companion female luer fitting section;

(c) means to secure said male connector member to said female connector member in matingly engaged position with the conduits in said members in alignment so as to permit communication therebetween;

(d) shield plates positionable so as to cover and isolate the conduits in said male and female connector members from the atmosphere, said shields being positioned intermediate the male and female connector members when said members are in said matingly engaged position, with one shield plate being affixed to the male connector member and the other shield plate being affixed to the female connector member, said shield plates being movable so as to uncover the respective conduits in said male and female connector members;

(e) a male luer fitting section positioned in the conduit of the male connector member, said section being adapted to isolate the end of the male connector member conduit opposite that covered by said male member shield plate from the atmosphere, said male luer fitting section being movable so as to engage and lock with female luer fitting section when said shield plates are positioned so as to uncover said conduits in the male and female connector members; and

(f) compressible seals positioned intermediate said male and female connector members and their respective shield plates, said seals being adapted to maintain isolation of said conduits from the atmosphere as said shield plates are moved so as to uncover said conduits, said seals expanding and contacting one another behind the trailing edge of said shield plates, thus forming a seal-line that advances as the shield plates are moved and preventing the sterile conduits within said male and female connected members from being exposed to the atmosphere,

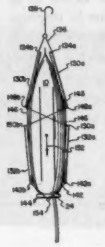
whereby said luer fittings may be readily and effectively engaged and locked in a sterile environment preserved by the seal-line of said compressible seals during the convenient moving of said shield plates to expose the conduit openings through which said luer fittings are engaged, said seals providing an added assurance against contamination of fluid passing through the engaged luer fitting within the connector without exposure of said seals to contact by said fluid passing through the connector.

4,187,847

AIRLESS INTRAVENOUS FLUID SYSTEM

Edward A. Loeser, 8646 Oak Valley Dr., Sandy, Utah 84070

Filed Jul. 11, 1977, Ser. No. 814,185
Int. Cl.[2] A61M 5/00
U.S. Cl. 128—214 F 3 Claims



1. An intravenous fluid therapy system comprising:

a non-vented source of intravenous fluid which is an intravenous-fluid-filled container having deformable side walls, an upper part, and a lower part with a mouth;

pressure means adapted to said source to pressurize said intravenous fluid, said pressure means including: said side walls, said surface members having edges with a plurality of attachment means affixed thereto along said edges and being sized in surface area dimensions proximate the size of the side walls of said container, and

tensioning means adapted to said surface members to cause said surface members to exert a force against said side walls, said tensioning means being an elastic member which is an elongated rubber strip removably positioned about and secured to selected attachment means in a pattern to tension said surface members together, and wherein

said spaced apart surface members are comprised of an upper pair of spaced apart surface members hingedly secured to each other along first edges thereof with means secured to said pair at said first edges to suspend said pair, and a lower pair of spaced apart surface members hingedly secured to each other along first edges thereof with an aperture formed along said edges wherein said upper pair of surface members are positioned about the upper part of said source and said lower pair of surface members are positioned about the lower part of said source with its mouth in said aperture and wherein said tensioning means is adapted to extend between the second edges of said upper pair opposite said first edges thereof and the second edges of said lower pair opposite said first edges thereof;

an airless flow meter to indicate the flow of intravenous fluid comprised of:

inlet connection means for connection with said tube means to receive said fluid from said source;

a chamber connected to receive said fluid from said inlet connection means, said chamber having flow indication

means positioned therein, which is a plurality of fins symmetrically secured to a hub rotatably mounted within said chamber;

outlet connection means connected to said chamber for connection to said tube means to receive fluid from said chamber and to supply fluid to said tube means;

wherein said fluid flows from said inlet to said outlet connection means to impinge on said fins to cause said fins to rotate proportionally to the flow rate of said fluid, said fins having magnetic means adapted thereto;

catheter means for insertion into the vein of a patent; and

tube means to connect said source to said flow meter and said flow meter to said catheter means.

4,187,848

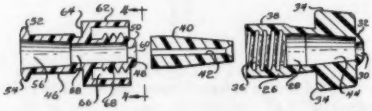
ADAPTER ASSEMBLY

Glenn N. Taylor, Cary, Ill., assignor to The Kendall Company, Boston, Mass.

Continuation of Ser. No. 816,553, Jul. 18, 1977, abandoned. This application Nov. 13, 1978, Ser. No. 959,961

Int. Cl.[2] A61M *3/00*

U.S. Cl. 128—247 **7 Claims**



1. An adapter assembly, comprising:

a syringe having a tip;

a catheter; and

a connector comprising, a body member having an elongated bore and an opening adjacent a distal end portion of the body member communicating with said bore, an elongated plug of elastic material received in said bore in a relatively uncompressed condition of the plug, said plug having a channel extending through the plug with a distal portion of the channel being aligned with the body member opening and with the internal dimensions of at least a distal portion of the channel being slightly larger than the outer dimensions of said catheter to receive the catheter through said body member opening, a compression member having a nipple adjacent a distal end of the compression member and receivable in a proximal end portion of the body member, said compression member having a port adjacent a proximal end portion of the compression member to receive the syringe tip, and a passageway communicating between the port and the distal end of said nipple, with a distal portion of said passageway being aligned with the plug channel when the nipple is received in the body member bore, and means for releasably attaching the compression member to the body member with said nipple received in said bore, and for controlling the distance said nipple projects into said bore such that the nipple compresses said plug in the bore and releasably secures the catheter in said plug channel, said compression member including a distal gripping element defining a space intermediate the gripping element and said nipple to receive the proximal end portion of the body member when the nipple is received in the body member bore.

4,187,849

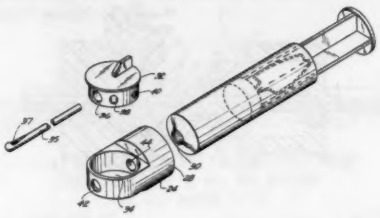
SUCTION CURETTAGE DEVICE WITH VALVE CONTROL AND SUPPORT MEANS FOR DIFFERING DIAMETER TUBES

Edward M. Stim, 1120 Lexington Ave., New York, N.Y. 10021

Filed Jul. 28, 1978, Ser. No. 928,806

Int. Cl.[2] A61M *1/00*

U.S. Cl. 128—278 **22 Claims**



1. A device for use in performing suction curettage procedures including a housing having at least one port therein through which the interior of the housing may communicate with a source of suction and a diametrically opposed opening therein, and a suction tube support member rotatably mounted in said housing; said tube support member having a plurality of intersecting and generally radially extending tube support bores of different diameters formed therein adapted to be selectively aligned between said housing port and opening, each of said bores being adapted to receive at least one differently sized suction tube therein through the housing opening whereby different tubes may be selectively connected to the housing and the source of suction.

4,187,850

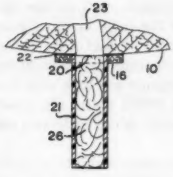
STOMA CENTERING APPARATUS

Charles F. Gust, Sky Harbor Estates Corp., 2959 Gulf Tobay Blvd., #422, Clearwater, Fla. 33515

Filed Dec. 12, 1977, Ser. No. 859,554

Int. Cl.[2] A61F *5/44*

U.S. Cl. 128—283 **6 Claims**



1. The method of replacing a full or used ostomy appliance on a person having a stoma for the excretion of waste material from the body, comprising the steps of:

a. removing said used ostomy appliance from the stoma;

b. initially cleaning the skin area about the stoma;

c. centering a hollow cylinder having an inside diameter slightly greater than the diameter of the stoma about the stoma and retaining said cylinder in a centered position;

d. inserting an absorbent material into said cylinder for absorbing waste material excreted from said stoma;

e. preparing the skin by cleaning and drying the skin area about the stoma with a skin prep agent while maintaining the cylinder in a sealing relationship about the stoma;

f. applying an adhesive substance to said prepared skin;

g. inserting a sealing ring over said cylinder and onto the skin for adherence to the skin; and,

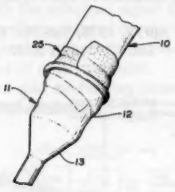
h. withdrawing said cylinder from the skin and adhering another ostomy appliance to said sealing ring.

4,187,851

SHEATH ARRANGEMENT FOR MALE URINAL DEVICE AND METHOD OF FORMING THE SAME

Thomas M. Hauser, St. Paul, Minn., assignor to Mentor Corporation, Minneapolis, Minn.

Filed Aug. 20, 1976, Ser. No. 716,112
Int. Cl.[2] A61F *5/44*
U.S. Cl. 128—295 **2 Claims**



1. The method of applying a urinal sheath to a penis which comprises:

providing a liner pad of resiliently compressible, deformable waterproof material in the form of a thin strip of such material having a width substantially less than the portion of the sheath intended to extend over the penis and of a length at least one and a half times the circumference of a normal flaccid penis, the inner and outer surfaces of the liner pad both being adhesive.

winding said strip spirally around said penis over a length of the penis much greater than the width of the strip and applying sufficient pressure during winding that the overlapping portions of the spirally wound strips adhere to each other,

providing a urinal sheath having an upper portion of thin flexible material designed for application to a penis for covering a substantial portion thereof lengthwise and having a lower thicker portion for connection through a suitable conduit to a urine receptacle, the thinner portion being rolled up until the rolled portion is adjacent the conical portion;

applying the rolled sheath to the penis with the lower thicker portion adjacent the glans of the penis and unrolling said sheath until the sheath extends over and beyond the uppermost edge of the spirally wound pad, and

applying squeezing pressure to the outer surface of the sheath to cause it to adhere circumferentially to the spirally wound liner pad, and to press the various elements into closely adhering contact including the contact between the sheath and the overlapped portions of the spirally wound pad to effect a liquid tight seal.

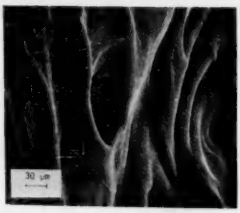
4,187,852

SYNTHETIC ELASTOMERIC INSOLUBLE CROSS-LINKED POLYPENTAPEPTIDE

Dan W. Urry, Bestavia Hills, and Kouji Okamoto, Birmingham, both of Ala., assignors to The University of Alabama, Birmingham, Ala.

Division of Ser. No. 704,088, Jul. 9, 1976, Pat. No. 4,132,746. This application Aug. 14, 1978, Ser. No. 933,598
Int. Cl.[2] A61B *17/04*; A61F *1/00, 1/20*
U.S. Cl. 128—334 R **3 Claims**

1. A method of forming and repairing bone structure in animals, comprising implanting in the animal body as a calcifiable matrix a synthetic elastomeric water-insoluble polypentapeptide prepared by cross-linking a first linear polypentapeptide and a second linear polypentapeptide, said first linear polypentapeptide being one consisting essentially of first pentapeptide units ($Val_1Pro_2Gly_3Val_4Gly_5$) and second pentapeptide units in which one of the amino acid residues of said first pentapeptide units is replaced by the residue of an amino acid having more than one amino function and said second linear polypentapeptide being one consisting essentially of first pentapeptide units ($Val_1Pro_2Gly_3Val_4Gly_5$) and second pentapeptide units in which one of the amino acid residues of said first



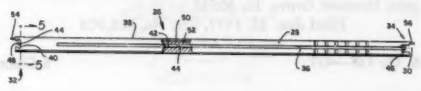
pentapeptide unit is replaced by the residue of an amino acid having more than one carboxyl function, said cross-linking being effected by the presence of an effective amount of an agent which causes reaction between free amino functions of said first linear polypentapeptide and free carboxyl functions of said second linear polypentapeptide.

4,187,853

ELECTRODE IMPLANTING APPARATUS WITH OPTIMUM LOCATION PROBE

Steven A. Barton, 401 S. Brazosport Blvd., Freeport, Tex. 77541, and Sidney M. Barbanel, 2265 River Valley Dr., West Columbia, Tex. 77486

Filed Nov. 6, 1978, Ser. No. 957,916
Int. Cl.[2] A61N *1/04*
U.S. Cl. 128—419 PT **6 Claims**



1. Apparatus for implanting an electrode, said apparatus comprising:

an elongate body having a tip;

means for temporarily securing said electrode to said tip;

means operatively associated with said body for contacting body tissue adjacent said electrode with a signal probe while said electrode is temporarily secured to said tip; and

means operatively associated with said body for selectably dislodging said electrode from said tip.

4,187,854

IMPLANTABLE DEMAND PACEMAKER AND MONITOR

Dennis G. Hepp, Coon Rapids; Robert A. Neumann, Blaine, and Paul Citron, New Brighton, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

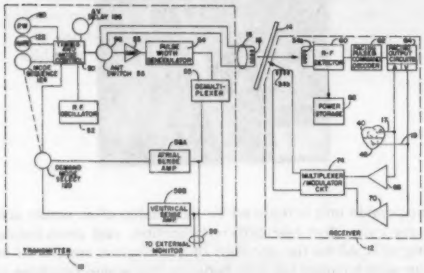
Filed Oct. 17, 1977, Ser. No. 842,389
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—419 PG **10 Claims**

7. Cardiac monitoring and stimulating apparatus for monitoring the activity of and for applying respectively first and second stimulating pulses to the atrial and ventricular portions of a patient's heart, said apparatus comprising:

(a) a first unit disposed externally of the patient's body and including means for transmitting electromagnetic energy within the patient's body;

(b) a second unit adapted to be surgically implanted within the patient's body, said second unit including means re-

sponsive to the externally generated energy for providing the sole energization of said second unit, second means including first and second electrodes coupled to sense the atrial and ventricular activity of the patient's heart for providing first and second electrical signals indicative of the atrial and ventricle conditions of the patient's heart, third means for sequentially transmitting said first and second signals externally in first and second time slots, respectively, and fourth means for respectively applying



the first and second stimulating pulses to the atrial and ventricular portions of the patient's heart; and

(c) said first unit comprising decoding means responsive to the transmitted first and second electrical signals indicative of the atrial and ventricle conditions of the patient's heart for providing decoded third and fourth output signals, and means responsive to said third and fourth output signals means for providing manifestations of the atrial and ventrical activity of the patient's heart.

4,187,855

GARMENT FOR USE AFTER BREAST SURGERY

Cornelia A. Paulus, and Nancy E. Paulus, both of 6719 Briargate, Downers Grove, Ill. 60515

Filed Jun. 22, 1977, Ser. No. 808,973
Int. Cl.[2] A41C *3/00*
U.S. Cl. 128—427 **8 Claims**

1. A garment to be worn after breast surgery having brassier-type mammary prosthesis to emulate a natural breast appearance of a wearer, the improvement comprising:

a body hugging, seamless shirt having a front and a back and a smooth interior adapted to fit snugly and comfortably about a person's body;

said shirt having expandable fabric means adapted to cling to and firmly hold the shirt in place on the wearer;

said shirt having a pair of enlarged arm openings and shoulder strap means associated with each arm opening;

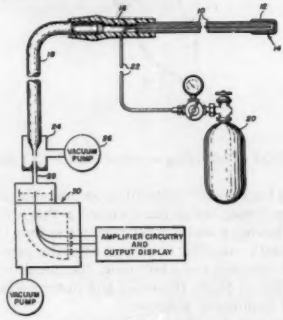
an elongated bodice with an extension with an open body for extending beyond and around the wearer's waist to assist in holding the shirt in place; prosthesis type bra means with means attached to the top front outside of said shirt leaving the bottom of said bra unattached without obstructing the smooth interior of the seamless outside shirt and said bra means having filler mean and then attaching the bottom of the bra means to said shirt providing a two-breast natural appearance garment to the wearer which will not ride up and stays in place on the wearer and cannot be easily observed through or be otherwise visible under outer garments.

4,187,856

HIGH-SPEED TRANSMISSION OF BLOOD STREAM GASES

Lawrence G. Hall, Creve Ceour, Mo., and Wayne J. Whistler, Glendora, Calif., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Apr. 3, 1978, Ser. No. 893,032
Int. Cl.[2] A61B *5/00*
U.S. Cl. 128—635 **1 Claim**



1. A system for providing blood gas specimens from blood vessels to a gas analyzer comprising:

a catheter having an outside diameter of approximately three millimeters comprising a distal end and a proximal end, said distal end being sufficiently sharp to enter a human blood vessel, said distal end having an opening sealed with a membrane impervious to blood,

a first conduit interconnecting the proximal end of said catheter and the gas analyser,

a capillary tube extending through the lumen of said catheter,

a carrier gas source containing a carrier gas substantially lighter than said blood gas,

one end of said capillary tube terminating at the distal end of said catheter,

a second conduit connecting said carrier gas source to the other end of said capillary for admitting a carrier gas into said capillary tube extracting means connecting to said first conduit for causing said carrier gas to expand substantially more than said blood gas,

said extracting means including a vacuum pump for carrying away said carrier gas.

4,187,857

ULTRASONIC WAVE DIAGNOSTIC APPARATUS TO CONCURRENTLY DISPLAY AN ECHO SIGNAL AND A REFERENCE SIGNAL

Shigeru Sato, Yamato, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Nov. 29, 1977, Ser. No. 855,808
Claims priority, application Japan, Nov. 29, 1976, 51-143142
Int. Cl.[2] A61B *10/00*
U.S. Cl. 128—660 **12 Claims**

1. An ultrasonic diagnostic apparatus for examining an object by concurrently displaying an M-mode ultrasonic echo signal and a representation of a reference signal comprising:

means for generating a fundamental pulse having a first frequency,

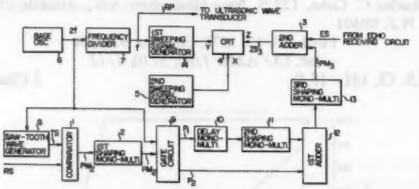
means coupled with said generating means for converting said fundamental pulse into a rate pulse having a second frequency 1/n times said first frequency, n being an integer ≧2,

an ultrasonic wave transducer coupled with said converting means and driven by said rate pulse to emit ultrasonic waves through the object at a rate equal to said second frequency,

means for detecting the reflected portions of the ultrasonic waves and forming an echo signal,

means coupled with the reference signal for pulse-position-modulating said reference signal in response to said fundamental pulse to produce n pulse-position-modulated pulses during the period of each rate pulse,

means coupled with said modulating means for rearranging



said n pulse-position-modulated pulses produced during a period of each rate pulse to fit within only a predetermined portion of each rate pulse,

means coupled with said detecting means and said rearranging means for combining the rearranged pulse-position-modulated pulses of said reference signal and said echo signal to form a combined signal,

means for generating a first sweep signal having the same frequency and being synchronous with said rate pulse,

means for generating a second sweep signal having a selected third frequency, and

display means coupled with said combining means, first sweep signal generating means and second sweep signal generating means for receiving and processing said combined signal, said first sweep signal and said second sweep signal to concurrently display a M-mode ultrasonic echo signal and the pulse-position-modulated pulses representing said reference signal.

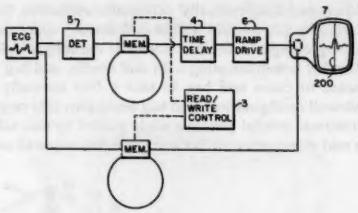
4,187,858

METHOD AND APPARATUS FOR ORIENTING THE DISPLAY OF INFORMATION FROM A RECIRCULATING MEMORY

Christopher C. Day, Newtonville, and Robert A. McEachern, Wellesley, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Apr. 17, 1978, Ser. No. 896,835
Int. Cl.² A61B *5/04*
U.S. Cl. 128—710 **9 Claims**

1. In apparatus having a recirculating memory means and a CRT means to display the ECG wave from a patient stored in the recirculating memory means, and means for detecting the R-wave of the ECG wave, the improvement comprising second recirculating memory means, clocking means responsive to the output of said R-wave detector to enter a single bit marker into said second recirculating memory means, time delay means responsive to said bit marker of said second memory means, the time delay of said time delay means corresponding to the predetermined interval prior to an upcoming full ECG wave, said time delay means outputting a trigger signal, and sweep circuit means responsive to said trigger signal for



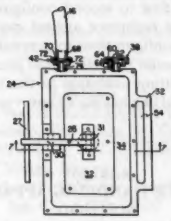
initiating the ramp signal applied to one axis of said CRT means.

4,187,859

RESPIRATING PUMP

Richard T. Allen, Easton, Md.; Rudolph H. Moyer, West Covina, Calif.; Donald J. Sibbett, Cucamonga, Calif.; Howard H. Anderson, Covina, Calif.; Glen R. Martner, Rosemead, Calif., and Don Willis, Garden Grove, Calif., assignors to Geomet, Inc., Gaithersburg, Md.

Filed May 1, 1978, Ser. No. 901,861
Int. Cl.² G01N *1/22*
U.S. Cl. 128—725 **11 Claims**



1. A respirating pump adapted for support upon the thoracic cavity and comprising:

(A) A housing, having an inlet and outlet;

(B) A diaphragm flexibly supported in one wall of said housing;

(C) A lever pivoted upon said housing, so as to movably engage said diaphragm at its inner end and abut the thoracic cavity at its outer end, such that expansion and contraction of said cavity during respiration moves said diaphragm as a pump; and

(D) An air pollution sampler attached to said inlet, such that movement of said diaphragm as a pump draws air through said sampler and into said housing and exhausts air through said sampler.

4,187,860

ARTERIAL BLOOD COLLECTION DEVICE

Frank K. Villari, Oak Park, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Sep. 1, 1977, Ser. No. 829,851
Int. Cl.² A61B *5/14*
U.S. Cl. 128—763 **9 Claims**

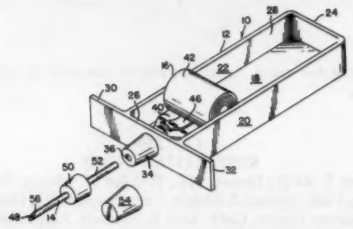
1. An arterial collection device, comprising:

an elongated housing having a proximal end, a distal portion, an elongated bottom wall having a pair of opposed sides, and a pair of elongated spaced sidewalls extending upwardly from the sides of said bottom wall and having a pair of upper edges, said bottom wall and sidewalls defin-

ing an elongated retention space and an elongated opening at the upper edges of said sidewalls;

a hollow needle connected to a distal portion of the housing; and

an elongated longitudinally expansible collection bag supported by said bottom wall in said housing space, said bag having elongated flexible sidewalls defining a collection chamber communicating with said needle, said bag having means to cause said bag to take a first normally rolled sidewall configuration, said bag being movable responsive to normal arterial pressure while guided by said sidewalls in said retention space between said first sidewall configu-



ration of longitudinally reduced bag dimensions with air substantially removed from said chamber, and a second sidewall configuration of longitudinally extended bag dimensions with said chamber enlarged to receive arterial blood and with said bag sidewalls unrolling during movement from said first to second configuration, said means having sufficient resistance against movement from said first to second configurations to prevent significant extension of the bag under normal venous pressure while simultaneously permitting extension of the bag under arterial pressure, and said bag having an anti-coagulate of blood in said chamber.

4,187,861

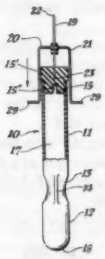
BLOOD SAMPLE HANDLING APPARATUS AND METHOD

Bart T. Heffernan, 26 Saranac Rd., Sea Ranch Lakes, Fla. 33308

Filed Feb. 21, 1978, Ser. No. 879,123

Int. Cl.[2] A61B *10/00*

U.S. Cl. 128—764 **10 Claims**



1. A specimen handling device, comprising:

a body,

a first relatively rigid body portion, said first body portion being shaped and structured having a first volume within said first portion, said first body portion including an entrance, said first body portion constructed of material to provide a said first volume that may be evacuated,

a second relatively rigid body portion connected to said first body portion, said second body portion being shaped and structured having a second volume, said second body portion constructed of material to provide a said second volume that may be evacuated,

at least one mid portion connected between said first body portion and said second body portion and providing an operable connection between said first volume and said second volume, each said mid portion having flexible walls movable toward one another for sealing shut and separating said first volume from said second volume, and

a first means for sealing shut said entrance, said first means composed of a resilient material whereby at least a portion of said walls lie in contact with adjacent walls when said first volume and said second volume are evacuated, and when clamping means are connected across said mid portion it will separate said first volume of said first body portion from said second volume of said second body portion.

4,187,862

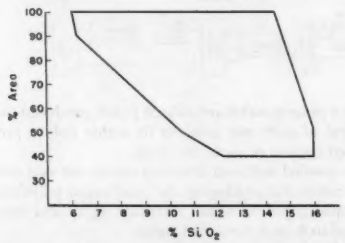
TREATMENT OF CIGARETTE PAPER

Charles C. Cohn, 123 S. New Hampshire Ave., Atlantic City, N.J. 08401

Filed Jul. 17, 1978, Ser. No. 925,224

Int. Cl.[2] A24D *1/00, 1/10, 1/12*

U.S. Cl. 131—15 R **3 Claims**



3. The process of making a cigarette in which a paper covering is formed into a cylinder to produce a cigarette wrapper, comprising the step of soaking at least part of the surface of the paper with an aqueous alkali metal silicate solution to impart a coating to the paper, the SiO_2 concentration by weight in the coating solution, and the coated area of said surface in any selected three millimeter long section of said cylinder being substantially within the boundaries of an area, on a rectangular plot, defined by straight lines joining the points 100, 6; 100, 14.5; 52, 16; 40, 16; 40, 12.2; 50, 10.5; and 90, 6.2, wherein the first number of each pair is the percentage ratio of the coated area to the total area, and the second number is the percentage of SiO_2 in the silicate solution by weight.

4,187,863

CYCLOALIPHATIC UNSATURATED KETONES AS ODOR AND TASTE MODIFYING AGENTS IN TOBACCO PRODUCTS

Ervin Kovats, Lausanne; Edouard Demole, Geneva; Günther Ohloff, Bernex, all of Switzerland, and Max Stoll, deceased, late of Lully, Switzerland (by Suzanne Stoll, executrix), assignors to Firmenich SA, Geneva, Switzerland

Division of Ser. No. 676,505, Apr. 13, 1976, abandoned, which is a division of Ser. No. 503,738, Sep. 6, 1974, Pat. No. 3,975,310, which is a division of Ser. No. 35,594, May 7, 1970, abandoned, which is a continuation-in-part of Ser. No. 774,179, Nov. 7, 1968, abandoned. This application Mar. 29, 1977, Ser. No. 782,536

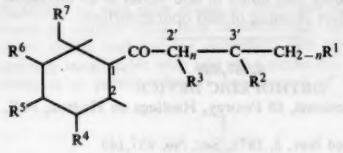
Claims priority, application Switzerland, Nov. 9, 1967, 15667/67; Nov. 1, 1968, 16309/68; May 7, 1969, 6976/69; Aug. 8, 1969, 12065/69; Apr. 4, 1970, 5559/70; Apr. 17, 1970, 5725/70

Int. Cl.[2] A24B *3/12*

U.S. Cl. 131—17 R **3 Claims**

1. A tobacco product having incorporated therein as a taste-

and flavour-modifying agent a substantially pure compound having the formula



I α, β, γ, δ

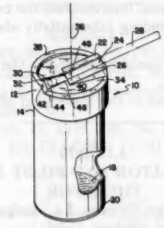
containing one double bond in position 2'- or 3'- of the acyl side-chain and either one double bond in position 1- or 2- or two conjugated double bonds in position 1- and 3- of the cycle, the double bonds being represented by dotted lines, and wherein n is zero or 1, R^1, R^2 and R^3 represent hydrogen or one of them a lower alkyl radical and the others hydrogen, and R^4, R^5, R^6 and R^7 represent hydrogen or one of them a lower alkyl radical and the others hydrogen.

4,187,864

CIGARETTE HOLDER FOR ASH RECEPTACLES

Michael Taddeo, 35-07 205th St., Bayside, N.Y. 11361

Filed Sep. 14, 1977, Ser. No. 833,090
Int. Cl.[2] A24F *19/00*
U.S. Cl. 131—242 **4 Claims**



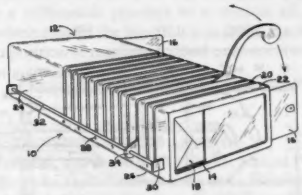
1. A cigarette holder for ash receptacles comprising a cylindrical tube, said cylindrical tube having an interior surface and upper and lower marginal edges, a plate, said plate having an upper lateral surface and a lower lateral surface, said plate being disposed fixedly secured to said interior surface of said tube at a location intermediate said upper and said lower marginal edges and extending substantially perpendicularly to the longitudinal axis to said tube, said tube having a passageway, said passageway having one end thereof located in said interior surface and intermediate said upper marginal edge and said upper lateral surface of said plate, the other end of said passageway located in said lower marginal surface of said tube, said plate having an opening therein, one end of said opening being disposed adjacent said one end of said passageway, said plate having a ramped surface, said ramped surface extending upwardly and outwardly from said upper lateral surface of said plate, said ramped surface having an elongated groove therein, said elongated groove having one end thereof disposed the other end of said opening, said opening having an elongated shape.

4,187,865

CIGARETTE CLIPPER

Johnny A. Burton, 1440 S. West Blvd., Rohnert Park, Calif. 94928

Filed Oct. 30, 1978, Ser. No. 956,262
Int. Cl.[2] A24F *13/24*
U.S. Cl. 131—250 **5 Claims**



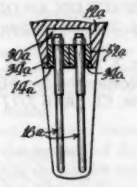
1. A cigarette clipping device comprising:
an open-ended casing of relatively rigid material and of a size and shape in cross-section to accommodate closely a package of cigarettes;
a plurality of parallel main slots in said casing from adjacent one end thereof, each of said main slots extending fully across the top of said casing and from said top down both sides thereof to levels near the bottom thereof;
a rail shaft mounted along one of said sides parallel to and adjacent the bottom of said casing;
a lever slidably and rotatably carried at one end thereof on said rail shaft and extending beyond the other of said sides; and
a knife edge along the bottom of said lever.

4,187,866

COMB WITH ROTATABLE TEETH

Jan M. Zwiren, Chicago, Ill.; Selma M. Casper, and Norman Sinclair, both of New York, N.Y., assignors to Helene Curtis Industries, Inc., Chicago, Ill.

Filed May 19, 1978, Ser. No. 907,789
Int. Cl.[2] A45D *24/00*
U.S. Cl. 132—151 **8 Claims**

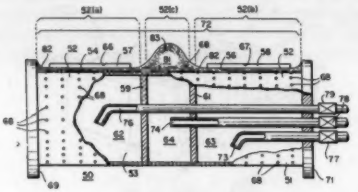


1. A comb comprising an elongated body having integral end portions extending generally perpendicular, said body having a substantially rectangular recess extending from a surface thereof between said end portions, said recess having a base wall, opposed sidewalls and opposed end walls, each end wall having a stepped configuration to produce a shoulder spaced from said base wall, an insert located in said recess and having opposite ends engaging said shoulder to produce a space between said base wall and an adjacent surface of said insert, said insert having a plurality of spaced circular openings with rotatable teeth located in the respective openings and extending from an opposed surface of said insert, each of said teeth having an enlarged head located between said base wall and said adjacent surface, each enlarged head having an axial dimension less than the spacing between said base wall and said adjacent surface to accommodate axial movement of said teeth in said openings.

4,187,867
FLUID BEARING

Charles J. Sherman, Frenchtown, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 786,512, Apr. 11, 1977, Pat. No. 4,138,047.
This application Oct. 2, 1978, Ser. No. 947,925
Int. Cl.[2] B65H *17/32, 23/24*
U.S. Cl. 134—64 P 6 Claims

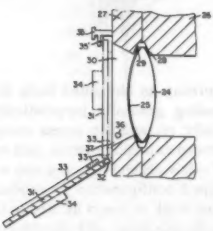


1. A web treating apparatus which comprises:
a tank containing a treating liquid; and
at least one liquid bearing capable of supporting a plurality of webs in spaced relationship in said liquid, said bearing comprising:
(a) a housing for containing said treating liquid within its interior, said housing having an outer surface for cooperating with a surface of each web to be supported;
(b) a guide means provided on said outer surface, defining with said outer surface a support channel, for maintaining each web to be supported within the boundaries of said defined support channel; and
(c) means for passing said treating liquid from said interior of said housing through said outer surface within said channel to the exterior, to form a treating liquid layer thereover having at least one liquid spike therein in a central portion of said channel, said liquid layer supporting each web to be supported and said liquid spike restricting each supported web to a specified area over said channel and in spaced relationship from adjacent supported webs in said channel when more than one such web is supported.

4,187,868
METHOD AND DEVICE FOR CLEANING A SLOPING OR VERTICAL SURFACE ON AN OPTICAL ELEMENT

Kjell Rudolphi, Ektorp, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden

Filed Mar. 3, 1978, Ser. No. 883,282
Claims priority, application Sweden, Mar. 7, 1977, 7702537
Int. Cl.[2] B08B *3/12*
U.S. Cl. 134—184 10 Claims

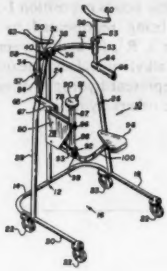


1. In an optical device comprising an optical element mounted therein, the improvement which comprises means for cleaning a surface of said optical element, said cleaning means being mounted on said optical device and comprising means for storing a cleaning liquid, means for applying cleaning liquid from said storing means onto said surface of said optical element, means comprising a closure member moveable to a closure position adjacent said optical surface and forming therewith a vessel for containing cleaning liquid applied from said storing means onto the surface of said optical element, and means for vibrating said liquid in said vessel at an ultrasonic frequency to effect cleaning of said optical surface.

4,187,869
ORTHOPEDIC DEVICE

Pasquale F. Marchetti, 10 Fenway, Hastings on Hudson, N.Y. 10706

Filed Nov. 3, 1978, Ser. No. 957,143
Int. Cl.[2] A61H *3/04*
U.S. Cl. 135—67 8 Claims



1. An orthopedic device comprising:
a frame;
caster means for supporting the frame;
a pair of rotatable support arms;
a pivot plate affixed to the frame for supporting the pair of rotatable support arms in a substantially horizontal position for rotation in a substantially horizontal plane;
a crutch staff mounted intermediate the ends thereof to each support arm extending substantially above and below the support arm;
a shoulder support member affixed to the upper end of each crutch staff; and
a hand grip mounted to the lower end of each crutch staff.

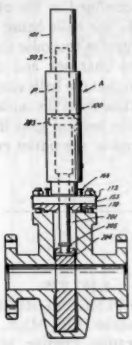
4,187,870
VALVE ACTUATOR AND PILOT ASSEMBLY THEREFOR

Neil H. Akkerman, New Orleans, La., assignor to Baker International Corporation, Orange, Calif.

Division of Ser. No. 794,571, May 6, 1977, Pat. No. 4,157,167.
This application Aug. 3, 1078, Ser. No. 930,462
Int. Cl.[2] G05D *7/00;* F16K *31/124*
U.S. Cl. 137—102 17 Claims

1. A flow line valve actuator respondable to a source of fluid pressure for moving an operative means of a valve between open and closed position, comprising: a housing defining a bore therethrough; a shaft carried in said housing and engagable with said operative means; piston means carried by one of said shaft and said housing and sealingly slidable along the other of said shaft and said housing and longitudinally movable within said cylindrical bore; first and second fluid chamber means companionly associated with said piston means yielding a differential force across said piston means upon increase of fluid pressure within one of said chamber means, said shaft being selectively shiftable longitudinally in a first direction to move said operative means to one of open and closed position by increase in fluid pressure within one of said first and second fluid chamber means, said shaft being selectively shiftable longitudinally in a second direction to move said operative means to the other of said open and closed position upon subsequent decrease in fluid pressure in one of said first and second chamber means and upon increase of fluid pressure

within the other of said first and second chamber means; pilot means within said housing having valve seat means thereon; normally free traveling spherical members immediate said pilot means defining valve head means and selectively sealingly engagable on said pilot means to open and close said pilot means to control fluid flow therethrough; and pilot spool means within said housing immediate said pilot means and operably associatable with said pilot means and said spherical members to permit selective engagement of said spherical



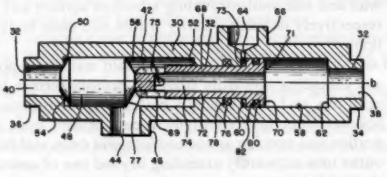
members onto said valve seat means of said pilot means, said spool means being selectively shiftable in one of linear and rotational directions within said housing immediate said valve head and seat means and not constrained against the other of linear and rotational directions to permit said fluid pressure to act within said actuator to manipulate said operative means between open and closed position upon only one of linear and rotational shifting of said spool means, the selective engagement of said head and seat means being sealingly insensitive to the other of linear and rotational shifting of said spool means.

4,187,871

PRESSURE-BIASED SHUTTLE VALVE

Richard C. Hendrickson, St. Charles, Mo., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 13, 1978, Ser. No. 877,200
Int. Cl.[2] G05D *11/00*
U.S. Cl. 137—112 **8 Claims**



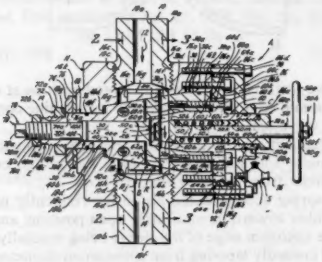
1. An improved shuttle valve apparatus comprising:
an elongate valve body;
a bore extending through said body;
first and second counterbores axially spaced within said valve body along said bore,
first and second ports communicating with said bore at opposite ends thereof;
a third port intersecting said bore between said first and second ports;
a shuttle slidably disposed within said first counterbore and cooperating in such manner as to allow selective communication between one of said first and second ports and said third port in response to fluid pressure at said first and second ports, and
means for biasing said shuttle in a first position to allow initial fluid flow from one of said first and second ports to said third port, said means for biasing including a bias piston disposed within said second counterbore and coupled to contact said shuttle and responsive to fluid pressure at one of said ports to move said shuttle to said first position, and
a channel in said valve body communicating with said second counterbore and cooperating in such manner as to provide a differential pressure to a portion of the bias piston which enables the bias piston to move the shuttle to said first position in response to fluid pressure from one of said first and second ports.

4,187,872

CONTROL VALVE ASSEMBLY

Murray E. Freeman, and Harmon E. Shipper, both of Pasadena, Tex., assignors to Tapco International, Inc., Houston, Tex.

Continuation of Ser. No. 737,509, Nov. 2, 1976, abandoned. This application Jul. 31, 1978, Ser. No. 929,817
Int. Cl.[2] F16K *11/12*
U.S. Cl. 137—454.6 **29 Claims**



1. A control valve assembly for controlling fluid flow in a flowline, comprising:
a housing adapted to be mounted with the flowline;
a normally operative flow control means and a movable element mounted substantially within said housing forming a first flow path to allow the passage of fluid from the flowline through said housing;
said normally operative flow control means normally controlling flow through said first flow path;
said movable element being for controlling flow through said first flow path independently of said normally operative flow control means;
said movable element having a second flow path formed therein to allow the passage of fluid from the flowline through said housing as desired; and,
safety means mounted with said movable element and in communication with said first flow path for releasing fluid pressure trapped in said first flow path between said movable element and said housing.

4,187,873

PRESSURE REGULATORS

Raphael Mehoudar, 36 Yehuda Hanassi St., Tel Aviv, Israel

Filed Jan. 29, 1973, Ser. No. 327,631
Claims priority, application Israel, Feb. 9, 1972, 38733
Int. Cl.[2] F16K *31/122*
U.S. Cl. 137—505.13 **1 Claim**

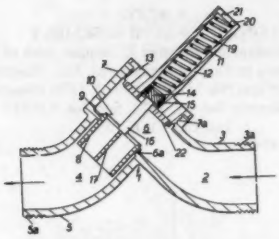
1. A liquid pressure regulator comprising:
(a) a body having a liquid flow inlet chamber connected to a liquid flow outlet chamber by an intermediate zone;
(b) an inwardly directed flange on the body establishing an axially narrow cylindrical guide surface, and a piston cylinder in the body opposite to and coaxial with the

guide surface, one end of the cylinder being vented and the other end being open to the intermediate zone;

(c) a valve seat surrounding the open end of the piston cylinder and exposed to the intermediate zone;

(d) a movable member having a tubular sleeve with an upstream edge, a coaxial piston opposite the upstream edge, and coupling means interconnecting the sleeve and the piston so that both move axially as a unit;

(e) the member being mounted in the body so that the sleeve slidably engages the guide surface and the piston slidably engages the piston cylinder, the sleeve being movable in the intermediate zone between a fully open position at which the upstream edge is maximally spaced from the



valve seat, and a substantially closed position at which the upstream edge is in substantially end-on line contact with the valve seat;

(f) a resilient seal on the piston sealingly engaged with the cylinder and sealingly separating the vented end of the cylinder from the open end;

(g) a spring acting on the piston for resiliently urging the member toward its maximally open position; and

(h) the upstream edge of the sleeve being coaxially bevelled and inwardly tapering from a maximum diameter substantially equal to the external diameter of the sleeve to a minimum diameter substantially equal to the internal diameter of the sleeve.

4,187,874

FLUID DIODE

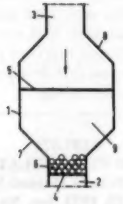
Jan Essebaggers, Nieuwerkerk aan de Ijssel, Netherlands, assignor to B.V. Neratoom, The Hague, Netherlands

Filed Nov. 1, 1977, Ser. No. 847,441

Claims priority, application Netherlands, Nov. 8, 1976, 7612384

Int. Cl.[2] F16K *15/04*

U.S. Cl. 137—533.11 **4 Claims**



1. A fluid diode for permitting fluid flow in a normal direction while substantially preventing reverse flow in the opposite direction, said fluid diode comprising:

a chamber having an inlet end adapted to be connected to a fluid supply pipe and an outlet end adapted to be connected to a fluid discharge pipe;

a first substantially flat pervious grid mounted adjacent to the inlet end of the chamber such that all fluid flowing through the chamber between the inlet and the outlet passes through said first grid;

a second substantially flat pervious grid mounted in the chamber and spaced from the first grid in the direction of the outlet end, the cross-sectional area of the chamber being larger at the location of the second grid than the cross-sectional area at the location of the first grid, and the area of the second grid being substantially greater than the area of the first grid; and

a multiplicity of balls confined in the chamber between said first and second grids, the balls being freely movable from one grid to the other grid in response to changed direction of fluid flow through the chamber, and the aggregate volume of the balls being such that the balls can shut off the first grid against reverse fluid flow from the outlet end to the inlet end but cannot shut off the second grid in the case of normal flow from the inlet end to the outlet end.

4,187,875

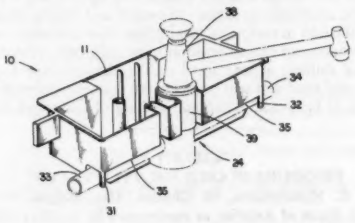
LIQUID DETERGENT RESERVOIR

Eugene R. Flynn, Farmington Hills, Mich., assignor to Manville Manufacturing Corporation, Pontiac, Mich.

Filed Aug. 15, 1977, Ser. No. 824,520

Int. Cl.[2] F16K *19/00*

U.S. Cl. 137—576 **5 Claims**



1. A liquid detergent reservoir for the retention and delivery of liquid detergent mixture which comprises:

a main body portion open at the top and having a bottom wall and side walls providing a bottom surface and sides respectively defining a cavity within said main body portion;

an air intake duct integrally a part of said main body portion and extending upwardly from the bottom surface to the open top, said duct having a passageway therethrough;

a hollow outlet tube integrally a part of said main body portion and opening at one end into said duct, said hollow outlet tube outwardly extending beyond one of said walls;

said duct having an aperture therethrough in said cavity adjacent the bottom surface of said main body portion, said aperture providing a path for fluid to flow from said cavity into said passageway;

said reservoir being of a single piece, molded plastic construction;

said side walls including upwardly extending elongate structural support features whereby said reservoir is structurally configured such that the reservoir is self-supporting in an upright, free-standing manner;

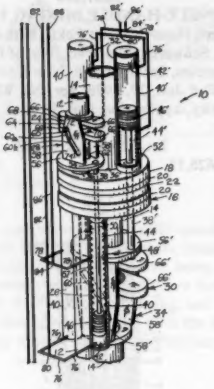
one of said sides being molded with a part cylindrical recess adapted to fit around a riser fitting of a dishwashing apparatus and being adapted with an offset shelf to fit over hot and cold manifold pipes connecting to said riser of said dishwashing apparatus.

4,187,876

SUB-SURFACE GATE VALVE

Heinrich Lang, Spring, Tex., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed May 8, 1978, Ser. No. 903,661
Int. Cl.[2] F16K *3/02, 31/524*
U.S. Cl. 137—594 13 Claims



1. A gate valve device, comprising:

a tubular housing having opposite end walls, enclosing at least one valve cavity;

an internal bulkhead extending crosswise of the housing, said at least one valve cavity being defined between a respective one of said end walls and said bulkhead;

means providing a longitudinal throughbore extending axially between the opposite end walls of said housing;

a gate valve interposed in said longitudinal throughbore within said one valve cavity, said gate valve including a valve gate transversally slidably disposed between two respectively confronting, full skirted valve seats;

the valve gate including a drive pin means having end portions laterally extending therefrom in two opposite directions and means journalling said drive pin on said valve gate for rotation about its own longitudinal axis;

means in said housing but isolated from said one valve cavity by said internal bulkhead defining a pair of longitudinally extending hydraulic cylinders, arranged laterally adjacent one another but on at least generally diametrically opposite sides of said longitudinal throughbore;

means defining a pair of piston rod-passing openings through the bulkhead coaxially with the respective ones of said cylinders;

a piston slidingly received in each cylinder and having a respective piston rod connected thereto and extending therefrom slidingly, sealingly through the respective one of said piston rod-passing openings and into said one valve cavity;

first hydraulic line means communicated through the housing with each hydraulic cylinder in such sense as to drive the pistons toward the internal bulkhead when hydraulic pressure is admitted to the hydraulic cylinders therethrough;

second hydraulic line means communicated through the housing with each hydraulic cylinder in such sense as to drive the pistons away from the internal bulkhead when hydraulic pressure is admitted to the hydraulic cylinders therethrough;

a cam assembly disposed within said one valve cavity and including:

(a) end plate means connecting between both piston rods; and

(b) two laterally spaced cam plate means flanking said gate valve, each cam plate means having a cam surface means maintained in contact with a respective end portion of said drive pin means, so that said drive pin means may roll thereupon as said cam assembly is axially moved by axial extension and retraction of said pistons;

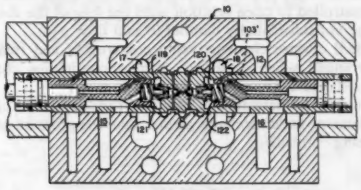
said cam surface means being obliquely oriented relative to the longitudinal axis of said housing, for converting longitudinal movement of said pistons into transverse movement of said valve gate.

4,187,877

COMPENSATED WORK PORT FLUID VALVES

Robert F. Hodgson, and John D. Petro, both of Youngstown, Ohio, assignors to Commercial Shearing Inc., Youngstown, Ohio

Continuation-in-part of Ser. No. 540,402, Jan. 13, 1975, abandoned. This application Jul. 25, 1978, Ser. No. 927,767
Int. Cl.[2] F15B *13/04*
U.S. Cl. 137—596 9 Claims



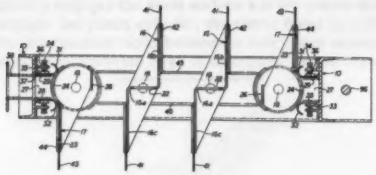
1. A compensated work port fluid valve comprising a directional control valve having a housing with inlet and outlet ports, a bore extending through said housing, a valve member movable in said bore, a pair of spaced inlet chambers intersecting said bore generally centrally thereof and connected to the inlet port, a pair of work chambers spaced from and on opposite sides of said inlet chambers, a pair of outlet chambers intersecting on opposite sides of said work chambers from the inlet chambers, said work chambers being adapted to be alternatively connected to one of said inlet chambers in one position of the valve member and to one of the outlet chambers in a second position of said valve member, an axial bore in each end of said valve member extending from one end to a point adjacent the center thereof and forming two spaced axial chambers, selectively communicating with one another and with a first pressure sensing passage in the housing intermediate the inlet chambers, a compensator spool movable in each said axial bore, each compensator spool having a groove intermediate its ends, spaced apart radial passages in each chamber communicating through the valve member to said bore, said passages being spaced so as to connect alternatively the work chamber with one of the adjacent inlet and outlet chambers, a second pressure sensing passage through the valve member to each said axial bore adjacent the end of the valve member, resilient means in each said axial bore urging each compensator spool toward one end of each said axial bore in the valve member and passage means connecting each compensator spool groove with the axial bore at the end adjacent the center of the valve member whereby pressure in the compensator spool groove acts on the compensator spool end and on the first pressure sensing passage and the selective communication between the chambers to connect the spaced radial passages and to meter flow therethrough.

4,187,878

VALVE HAVING INTERNALLY PRESSURIZED SEALING ELEMENTS

John E. Hughey, Birmingham, Ala., assignor to Zurn Industries, Inc., Birmingham, Ala.

Filed Dec. 23, 1977, Ser. No. 863,803
Int. Cl.[2] F16K 1/22
U.S. Cl. 137—601 5 Claims



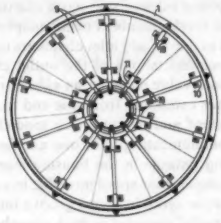
1. In a valve,
(a) a plurality of plate-like closure elements generally Z-shaped in cross section and of a size substantially to span an opening in an enclosure containing fluid under pressure different from atmospheric pressure,
(b) means mounting the closure elements for movement from sealing position with the legs of the Z-shapes thereof substantially normal to the flow path of the fluid being controlled to open position with the legs of the Z-shapes thereof substantially parallel to said flow path,
(c) said closure elements being constructed and relatively arranged when closed to form a continuous chamber substantially spanning said opening, and
(d) means to maintain the chamber formed by the closure elements under pressure greater than the pressure of fluid being controlled.

4,187,879

FLOW REGULATOR

Karl-Erik Fermér, and Leif Hulthe, both of Jönköping, Sweden, assignors to AB Svenska Flaktfabriken, Nacka, Sweden

Filed Mar. 24, 1978, Ser. No. 889,976
Claims priority, application Sweden, Mar. 31, 1977, 7703730
Int. Cl.[2] F16K 1/22
U.S. Cl. 137—601 10 Claims



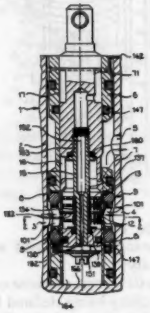
1. A flow regulator for controlling a gas flow, a tubular casing having a gas-flow passage therethrough, a plurality of radial shafts in said casing, an adjustable blade mounted for pivotal movement on each shaft axis, each blade extending from said casing inwardly and ending adjacent the geometrical center axis of said tubular casing, a hub located concentrically in said casing adjacent said center axis, an adjusting ring concentrically located on one side of said hub and having an adjusting mechanism, said ring being connected to all blades and being operable to pivot said blades simultaneously and uniformly, the improvement wherein said shafts are fixedly secured to both said casing and said hub, and that each blade is pivotally mounted on its shaft by means of an outer bearing adjacent said casing and by means of an inner bearing adjacent said hub, said outer bearing being positioned on said shaft at least indirectly by said casing, and said inner bearing being positioned independently of said hub and that each blade has a protruding crank connected to said adjusting ring for displacement thereby.

4,187,880

SINGLE-HANDLE MIXING VALVE

Jürgen Humpert; Hans-Joachim Eckel, both of Hemer, and Rolf Behrenberg, Schwerte, all of Fed. Rep. of Germany, assignors to ITT Industries, Incorporated, New York, N.Y.

Filed Jun. 29, 1978, Ser. No. 920,369
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1977, 2731809
Int. Cl.[2] F16K 11/02
U.S. Cl. 137—625.17 9 Claims



1. A single-handle mixing valve comprising:
a valve casing having a central bore, a pair of first fluid inlets and a first fluid outlet;
a cylindrical sleeve within said bore and including a pair of radially disposed inlet bores in communication with said first fluid inlets and a fluid outlet bore in communication with said first fluid outlet;
a hollow piston disposed within said sleeve, said piston being rotatable to control the fluid mixing ratio and axially shiftable to control the fluid flow volume;
a pair of sealing elements, each sealing element being carried in a corresponding one of said inlet bores;
each of said sealing elements comprising:
a rim-type molded body having a central aperture and arcuately formed to correspond to the outer surface curvature of said piston, and a sealing cord ring buttoned on said molded body, said sealing cord ring providing a seal between said sleeve and said casing and between said sleeve and said piston;
said piston having a plurality of longitudinal slots radially arranged along the axial direction of said piston, each of said slots having a length and a width of smaller dimension than the cross-sectional diameter of said sealing cord ring; and
noise silencing means disposed within said piston.

4,187,881

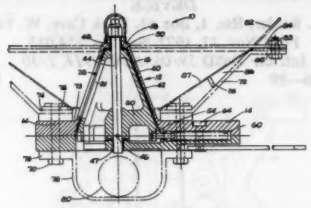
CONE VALVE ASSEMBLY

George A. Kull, St. Charles, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Jun. 23, 1978, Ser. No. 918,231
Int. Cl.[2] F16K 31/53, 31/54
U.S. Cl. 137—625.31 9 Claims

1. A container outlet valve assembly comprising: a generally cone-shaped housing surrounding a container opening; said housing extending upwardly into the container, and including

radially spaced outer openings in the cone housing for lading to flow out of the container; a cone valve located within the housing containing spaced valve openings which align with the housing outer openings when the cone valve is in open position; a liner of low-friction material attached to one of the outer surface of the cone valve and/or the inner surface of the



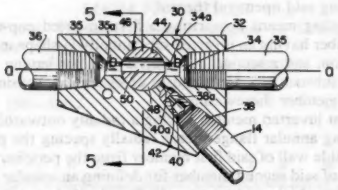
cone housing; said cone valve being rigidly attached to a vertically extending shaft which is journaled for rotation in a bearing in the cone housing; said cone valve being rotatable between a closed position in which the valve body closes the openings located in the cone valve housing, and an open position wherein the valve openings align with the housing openings to allow lading to flow out of the container.

4,187,882

DIVERTER-VALVE APPARATUS

John D. Watson, 906 E. Harmony La., Fullerton, Calif. 92631

Filed Aug. 18, 1978, Ser. No. 935,028
Int. Cl.[2] F16K *11/085*
U.S. Cl. 137—625.47 **4 Claims**



1. A diverter-valve apparatus adapted to be operably positioned between a pump means within a high-pressure system and the working device operated by said system, the system having a reservoir, wherein said diverter valve comprises:

a main housing;

an inlet port longitudinally disposed in said body;

an outlet port longitudinally disposed in said body and oppositely positioned to said inlet port on a commonly aligned axis therewith;

a bore formed in said body transversely thereof, and interposed between said inlet and outlet ports, said ports communicating with said bore;

a bypass port formed in said body and angularly disposed relative to said inlet port, and communicating with said bore; and

a flow-control means operably disposed in said bore of said body, wherein said means in an open mode allows fluid flow from said inlet port to said outlet, and wherein said means in a closed mode diverts fluid flow from said inlet port to said bypass port when said outlet port is closed thereby, said flow-control means comprising a cock-stem member rotatably disposed in said bore of said body, and a flow-control diverter passage having a longitudinal axis positioned in said cock stem so as to allow fluid flow between said inlet port and said outlet port, and to divert fluid flow from said inlet port to said bypass port without substantially affecting the pressure within said pressure system, said longitudinal axis of said flow-control passage, when in a communicating open position between said inlet and outlet ports, is eccentrically disposed to the axis of said inlet and outlet ports and in a parallel alignment therewith, and when said axis of said flow-control passage is rotated to a closed position one end of said passage is closed to prevent fluid flow to said working device, and the opposite end thereof is positioned to overlap said inlet port and said bypass port to divert fluid flow back to said reservoir within said system;

means within said bypass port for metering the flow of fluid therethrough and regulating the pressure thereof to simulate the pressure drop of said working device,

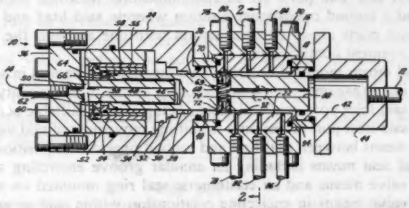
wherein said metering means comprises a removable plug member having an orifice formed therein, the size of said orifice being determined by the pressure drop provided by its associated working device.

4,187,883

MULTIPLE POSITION VALVE

George R. Webster, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed Jan. 31, 1978, Ser. No. 873,931
Int. Cl.[2] F16K *11/06, 45/00*
U.S. Cl. 137—625.68 **4 Claims**



1. A multiple position valve, comprising

a body having an internal bore, and a plurality of stepped counterbores coaxial with said bore and forming a series of stepped shoulders,

a first piston mounted for reciprocation in said bore,

means for introducing supply fluid at a reference pressure into said bore at one end of said piston,

a plurality of nested pistons connected to the opposite end of said piston,

each one of said nested pistons being of a diameter to enter one of said counterbores and engage its shoulder so that as said nested pistons progressively engage the shoulders of their respective counterbores the smaller of said nested pistons are free to move toward their counterbores' shoulders,

a plurality of control ports, a supply port and an exhaust port through said body,

means for delivering said supply fluid to one of said control ports and establishing communication to said exhaust port from the remainder of said control ports, and

means for introducing a pilot pressure fluid into said counterbores to urge said nested pistons and said first piston in the opposite direction from the direction in which said first piston is urged by said supply fluid,

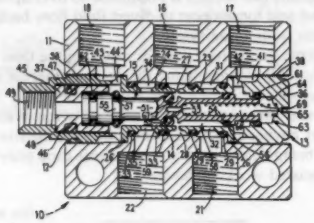
said nested pistons having preselected areas whereby preselected fluid pressure exerted on said nested pistons moves said nested pistons to positions at which communication is established with preselected ones of said control ports.

4,187,884

FOUR-WAY VALVE EMPLOYING FLUID SPRING

Stanley M. Loveless, Oshtemo Township, Kalamazoo County, Mich., assignor to General Gas Light Company, Kalamazoo, Mich.

Filed Jun. 12, 1978, Ser. No. 914,795
Int. Cl.[2] F15B 13/042
U.S. Cl. 137—625.69 6 Claims



1. In a valve assembly including housing means having elongated bore means formed therein, a plurality of ports formed in said housing means and communicating with said bore means, said plurality of ports including inlet, outlet, and load ports, and valve means movably positioned within said bore means and disposed in sealed slidable engagement with said housing means for controlling the flow of a compressible pressure fluid between said ports, said valve means being axially movable between a first operational position wherein said inlet and load ports are in communication with one another and a second operational position wherein said load and exhaust ports are in communication with one another, the improvement comprising:

seal means mounted on said valve means and disposed in sealing engagement with said housing means in the vicinity of said inlet port, said seal means being axially shiftable across said inlet port in response to shifting movement of said valve means between said first and second operational positions;

said seal means including an annular groove encircling said valve means and an elastomeric seal ring mounted on said valve means in encircling relationship within said groove, said seal ring being disposed in sealing engagement with said housing means, said annular groove having an axial width substantially greater than the axial width of said seal ring so that the seal ring can be shifted axially along said groove relative to said valve means, said annular groove being in substantially continuous communication with said inlet port, and said seal ring being shifted axially relative to said groove by the pressure fluid supplied through the inlet port when the valve means is shifted between said first and second operational positions; and

fluid spring means coacting between said valve means and said housing means for normally urging said valve means toward said first operational position, said fluid spring means including a spring chamber defined between one end of said valve means and the adjacent portion of said housing means, said spring chamber being defined within a closed end of said bore means, and passage means extending interiorly of said valve means for providing substantially continuous communication between said chamber and said inlet port, said passage means terminating in a hole which opens through the bottom of said groove substantially midway between the opposite axial ends thereof, said seal ring being disposed at one axial end of said groove when said valve means is in said first operational position, said seal ring being disposed adjacent the other axial end of said groove when said valve means is in said second operational position, whereby said hole is closed by said seal ring only momentarily during the axial displacement of said seal ring during the shifting thereof between the opposite ends of said groove in response to shifting of said valve means between said first and second operational positions so that pressure fluid supplied through the inlet port continuously communicates with said spring chamber.

4,187,885

THREE-POINT, PLUG TYPE SEALING MEANS FOR A HOLLOW, CYLINDRICAL CONTAINER, PARTICULARLY A LIQUID-FILTERED SMOKING DEVICE

Richard W. Kahler, Rte. 1, Box 61, Rock Cave, W. Va. 26234

Filed Nov. 22, 1977, Ser. No. 854,033
Int. Cl.[2] B65D 59/06; A24F 1/14, 1/30
U.S. Cl. 138—89 5 Claims

1. A sealing device for closing an open end of a hollow, tubular member comprising:

three-point, plug type sealing means, mounted upon an open end of a hollow, tubular member, for engaging at least two primary surfaces of said tubular member and thereby closing said open end thereof;

said sealing means comprising a first, inverted cup-shaped member having an inverted substantially U-shape in cross-section, and a second cup-shaped member having a portion substantially U-shaped in cross-section housing said first member therewithin;

said first inverted member having a radially outwardly projecting annular flange means radially spacing the peripheral side wall of said first member from the peripheral side wall of said second member for defining an annular recess within which said open end of said tubular member is disposed for enhancing the sealing characteristics of said sealing means; and

said tubular member being seated within said recess and in frictional contact with said peripheral side wall of said first member and said peripheral side wall of said second member, said annular recess having a width substantially equal to the thickness of the wall of said tubular member, said wall of said tubular member being beadless.

4,187,886

DOBBY FOR THE FORMATION OF THE SHED ON LOOMS

Joseph Palau, Duingt, France, assignor to S.A. des Etablissements Staubli, Faverges, France

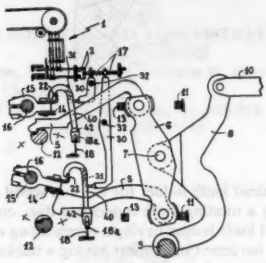
Filed Jul. 28, 1978, Ser. No. 929,140
Claims priority, application France, Oct. 14, 1977, 77 31678
Int. Cl.[2] D03C 1/26
U.S. Cl. 139—68 4 Claims

1. In a loom dobby having a frame supporting multiple double swinging levers each coupled to a heddle frame, each lever being displaceable by two pulling hooks pivotally connected thereto, the dobby having pulling knives operative to displace the pulling hooks when the latter engage the pulling knives, the dobby having lowering knives operative when contacting the hooks to move them into engagement with the pulling knives, and the dobby having a pattern mechanism,

improved means for raising the pulling hooks out of engagement with the pulling knives under the control of the pattern mechanism, comprising:

a crosspiece coupled with each lowering knife and moving through a path therewith;

a stirrup associated with each pulling hook and having a first portion located to engage the pulling hook and having a second portion located adjacent to a crosspiece;



a rocking lever associated with and coupled to each stirrup and carried by the frame, each rocking lever being coupled with the pattern mechanism and selectively actuated thereby to move the second portion of the stirrup selectively out of the path of the crosspiece or into the path of the crosspiece whereby to raise the stirrup and move the associated pulling hook away from the engagement with the pulling knife.

4,187,887

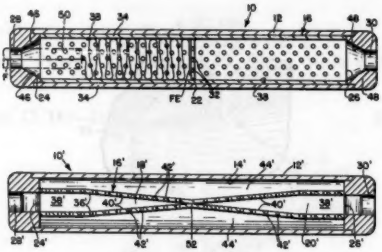
LOOM PROJECTILE

Petras Cyvas, Worcester, Mass., assignor to Crompton & Knowles Corporation, New York, N.Y.

Filed Nov. 13, 1978, Ser. No. 960,344

Int. Cl.[2] D03J *5/06*

U.S. Cl. 139—196.2 **16 Claims**



1. A projectile for use in a loom in which filling picks are inserted from an outside supply source, the projectile comprising:

(a) an elongated body having an inlet opening at one end and outlet opening at the opposite end thereof,

(b) an outer wall defining the outer shape of the body,

(c) a perforated inner wall defining a generally flat filling storage chamber within the body, said storage chamber being connected to the inlet opening, and

(d) a passageway located between the inner and outer walls, said passageway being connected to the outlet opening and to the storage chamber by the perforations in the inner wall.

4,187,888

SUPPLY SYSTEM FOR A PNEUMATIC WEAVING MACHINE

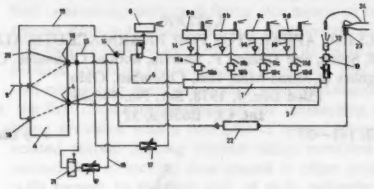
Hubert P. van Mullekom, Deurne, Netherlands, assignor to Ruti-te Strake B.V., Deurne, Netherlands

Filed Sep. 3, 1978, Ser. No. 939,708

Claims priority, application Netherlands, Aug. 25, 1977, 7709425

Int. Cl.[2] D03D *47/30*

U.S. Cl. 139—435 **2 Claims**



1. A supply system for a pneumatic weaving machine comprising a source of air under pressure, a pressurized air container, main air conduit means, a main control valve, the main air conduit means connecting the container to the main control valve and the main control valve connecting the main air conduit means to the source of air, blowing nozzles operatively connected to the air container, auxiliary air conduit means connecting the main control valve to the blowing nozzles, and reduction valve means in the auxiliary air conduit means for supplying air of reduced pressure to the nozzles to insert weft yarn into the machine when starting the machine, the main control valve venting the auxiliary air conduit means and connecting the main air conduit means to the source of air under operational conditions and venting the container and connecting the auxiliary air conduit means to the source of air when the machine is stopped.

4,187,889

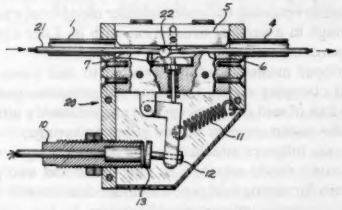
WIRE PINCH MARK DETECTOR FOR USE IN METHOD AND APPARATUS FOR SEMIAUTOMATICALLY MANUFACTURING ELECTRICAL WIRE HARNESS

Albert L. Hametner, Seattle, Wash., and Mark S. Soderberg, Ketchum, Id., assignors to The Boeing Company, Seattle, Wash.

Filed Aug. 14, 1978, Ser. No. 933,244

Int. Cl.[2] B21F *23/00*

U.S. Cl. 140—92.1 **5 Claims**



1. In the method of assembling electrical wire harnesses wherein an elongate wire segment having two pinch marks representative of the end thereof is withdrawn from a storage zone and laid onto a formboard along a predetermined path toward a formboard pin, the steps of detecting and compensating for excess wire segment length of said elongate wire segment comprising:

enabling a length encoder for measuring said elongate wire

segment while said wire segment is laid onto the formboard along a predetermined path toward said formboard pin;

providing pinch mark detector detection when enabling said length encoder; and then,

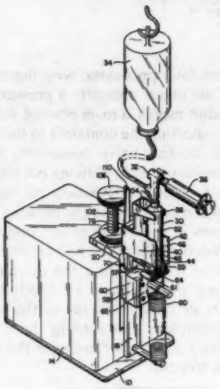
making one or more wraps of the end of said elongate wire segment around said formboard pin when said length encoder and pinch mark detector are indicative of said elongate wire segment having an end thereof exceeding a predetermined distance beyond said formboard pin.

4,187,890

FILLING APPARATUS FOR PHARMACEUTICALS

Paul E. Stach, and Thomas P. Sherrin, both of Columbus, Ohio, assignors to Mono-Med, Inc., Columbus, Ohio

Filed Dec. 4, 1978, Ser. No. 966,364
Int. Cl.[2] B65B *3/32*
U.S. Cl. 141—27 **6 Claims**



1. An apparatus for use in filling relatively smaller containers with measured amounts of a liquid from a bulk container, the apparatus including a support frame, a motor drive means mounted to the support frame, a motor drive control circuit, a pumping syringe, a first check valve connected to permit fluid flow from said bulk source to the Luer fitting of said pumping syringe and a second check valve connected to permit fluid flow from said Luer fitting to said relatively smaller receiving container, said apparatus comprising:

(a) clamping means mounted to said support frame for releasably retaining the outer cylinder member of a pumping syringe in a vertical orientation with its Luer connector uppermost;

(b) gripper means slideably mounted to said frame below said clamping means for linear reciprocation parallel to the axis of said pumping syringe and releasably attachable to the piston member of said pumping syringe;

(c) a cam follower attached to said gripper means;

(d) biasing means attached to said frame and said gripper means for urging said piston member downwardly toward increasing the volume of said syringe;

(e) a rotatable cam drivingly connected to said motor drive means and engagable with said cam follower for cyclically, alternately raising said piston member against the urging of said biasing means to a top dead center position and permitting it to be lowered by the urging of said biasing means; and

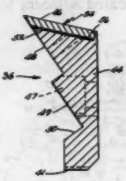
(f) adjustable stop means for being engaged by said gripper means at a selected level below said top dead center position for controlling the stroke of said syringe.

4,187,891

WEAR PART

Theodore C. Weill, 110 Carol Cir., Tylertown, Miss. 39667

Division of Ser. No. 614,494, Sep. 18, 1975, Pat. No. 4,059,884.
This application Jun. 16, 1977, Ser. No. 807,235
Int. Cl.[2] B27C *1/14*
U.S. Cl. 144—162 R **3 Claims**



1. A repaired knife holder for use in a wood chipper of the type having a rotating knife supporting disc, comprising:

a repaired knife holder having a recess along a wear surface;

a surface hardened steel insert having a thickness between $\frac{1}{8}$ and $\frac{1}{4}$ inch and a width between 1 and $1\frac{1}{4}$ inches slip fit within said recess, said insert having a coefficient of thermal expansion substantially equal to that of the knife holder, said recess and insert having grit blasted enlarged mating surfaces; and

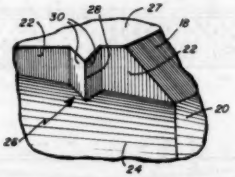
a silver alloy filler material within said recess bonding said insert to said knife holder at said grit blasted enlarged mating surfaces, said filler material having a flow point of approximately 1120° F. and said insert being induction brazed within said recess at a temperature of approximately 1200° F. for a period of one to two minutes.

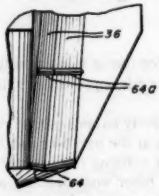
4,187,892

RECESSED SCREW HEADS AND DRIVERS

Frederick A. Simmons, Framingham, Mass., assignor to Phillips Screw Company, Gloucester, Mass.

Division of Ser. No. 505,324, Sep. 12, 1974, Pat. No. 4,084,478.
This application Oct. 31, 1977, Ser. No. 846,987
Int. Cl.[2] B25B *15/00*
U.S. Cl. 145—50 A **10 Claims**





1. A driving tool for engagement with a recess in an end of a screw comprising:

a shank portion and a recess-engaging portion formed at an

end of said shank portion, said recess-engaging portion comprising a central core and a plurality of blades radiating from said core, said core being defined in part by an intermediate wall extending between each pair of adjacent of said blades; and

a rib formed along the lower edge of each of said intermediate walls and extending between each of said pairs of adjacent blades.

4,187,893

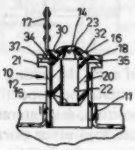
COMBINED ADDITIVE AND ADMINISTRATION PORT FOR A CONTAINER

Albert F. Bujan, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Jul. 19, 1978, Ser. No. 925,919

Int. Cl.[2] B65D *33/16*

U.S. Cl. 150—8 **22 Claims**



1. A combined additive and administration port for a container for I.V. liquids comprising:

a tubular walled port in communication with the inside of said container;

an inner diaphragm member forming a portion of said port and sealing the inside of said container to outside atmosphere;

an outer resealable and pierceable member removably secured to said port and positioned from said diaphragm member in a direction opposite the inside of said container; and

a tab portion operatively associated with said resealable member for removing said resealable member from said port separately from said diaphragm member.

4,187,894

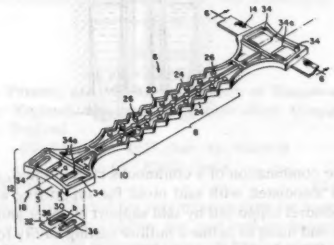
TIRE TRACTION DEVICE

Ted S. Peterson, 1908 SE. 16th Pl., Renton, Wash. 98055

Filed Mar. 6, 1978, Ser. No. 883,702

Int. Cl.[2] B60C *27/02*

U.S. Cl. 152—222 **3 Claims**



1. A traction device for a tire, said tire having a tread surface and a circumferential axis extending around and along said tread surface, said traction device being adapted to engage said tire along said circumferential axis, said traction device comprising:

a. a plurality of cross members, each having a lengthwise axis and adapted to engage said tread surface with its lengthwise axis generally perpendicular to said circumferential axis, each cross member having an outer surface adapted to engage a road surface and an inner surface adapted to engage said tread surface,

b. a pair of elongate straps adapted to be positioned on opposite sides of the tread surface so as to extend circumferentially around side portions of said tire, with said straps positioning said cross members at spaced locations along said circumferential axis,

c. a plurality of pairs of connecting members, each pair of connecting members being located on opposite ends of a related cross member, each connecting member having a first connecting portion defining slot means to receive a related strap in threaded through relationship, and a second locking portion adapted to engage its related strap at selected locations there-along so as to lock that strap to said connecting members at such selected locations,

d. the first connecting portion of the connecting member being provided with a first pair of spaced slots, and its related second locking portion being provided with a second pair of locking slots spaced in offset relationship with respect to the first pair of slots, whereby with a related strap threaded through both pairs of slots, when tension is applied to said strap, said first and second portions of the connecting member press that strap in locking wedging engagement with the connecting member,

whereby said cross members may be moved to selected locations along said straps to first desired locations along said tire and locked in place, and said cross members can be moved to second desired locations and again locked in place at said second locations, so that tires of different sizes can be fitted with said traction device, and so that in the event one cross member is broken and removed from said straps, the remaining cross members can be repositioned along the circumferential axis of said tire in proper location.

4,187,895

METHOD AND APPARATUS FOR AUTOMATICALLY ASSEMBLING SPOKED WHEELS

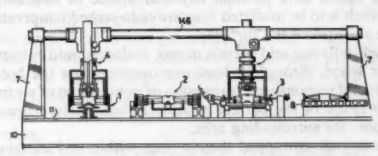
Teturo Saruwatari, 2 of 22, Shinsayama 2, Sayama-shi, Saitama-ken, and Yositaka Mukai, 10 of 3243, Kaminanbata, Fujimishi, Santama-ken, both of Japan

Filed Jun. 23, 1976, Ser. No. 699,087

Claims priority, application Japan, Jun. 24, 1975, 50-77783

Int. Cl.[2] B21K *1/34*

U.S. Cl. 157—1.55 **7 Claims**



1. Apparatus for inserting spokes in a wheel, said wheel including a hub having a plurality of holes, ech hole for pivotably receiving an individual spoke, a rim concentric with said hub having a plurality of rim holes, each hole to receive therethrough an individual spoke, and a plurality of spokes of extended length, one end of said spokes connecting to said hub, the other end of said spokes passing through said rim holes after said spokes have been twilled, comprising:

a support structure including:

(a) primary support means for retaining said hub with twilled spokes attached, the axis of rotation of said hub being vertical;

(b) spoke support means for retaining and supporting said twilled spokes near the other ends of said spokes away from said hub, said other ends of said spokes aligned to a single circle, said single circle being substantially of the same diameter as the inner circular surface of said rim;

(c) and deflection means for deflecting the middle section of said spokes while the opposite ends of said spokes are retained one end in said hub and said other end by said spoke support means;

(d) means for retaining said rim concentric with said axis of said hub, said rim having spoke receiving holes therein, said rim holes arranged in a circle on the inner circular surface of said rim, and each of said rim holes in said rim in substantial alignment with the other end of one of said spokes;

(e) and means for withdrawing said spoke deflection means whereby said spokes unflex and said other ends enter said rim holes; and

(f) means for releasing said primary support means and said spoke support means, whereby a twilled arrangement of spokes on a hub have the remote other ends of the spokes retained while said spokes are flexed, the release of said flexure causing said other spoke ends to simultaneously enter and pass through said aligned rim holes to thereby ready said wheel for application of spoke fasteners.

4,187,896

SELF-INFLATING SOLAR CURTAIN

Ronald H. Shore, P.O. Box 130, Snowmass, Colo. 81654

Continuation of Ser. No. 833,581, Sep. 15, 1977. This application May 19, 1978, Ser. No. 907,707

Int. Cl.[2] E06B *9/08*

U.S. Cl. 160—121 R **15 Claims**

1. A dynamic process for insulating an interior side of a surface, said process comprising the steps of:

(a) implacing or removing a curtain, including an entrapped air space, in a position adjacent a side of said surface which is to be insulated responsive to sensed temperatures in the area of the surface;

(b) self-inflating said curtain means, including said entrapped air space, through at least one opening near the bottom thereof responsive to expansion or contraction of air in the air space of the curtain as ambient temperature heats or cools the surrounding area;

so that any air entrapped therein rises within said curtain responsive to a heating of said entrapped air by increases in temperatures adjacent said curtain, the heated air expanding the volume of said air space whereby fresh air is drawn through said opening by an inhalation process.

4,187,897

TILTING CONNECTOR FOR VENETIAN BLIND SLAT ENDS

Kurt H. Frentzel, Zevenhoven, Netherlands, assignor to Hunter Douglas International, N.V., Netherlands Antilles

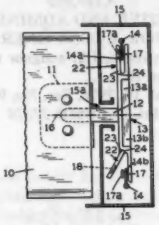
Filed Jun. 2, 1978, Ser. No. 911,825

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1977, 2725601

Int. Cl.[2] E06B *9/38*

U.S. Cl. 160—177 **6 Claims**

1. In a slat guiding and tilting connector for the slats of a venetian blind having a plurality of slats each with opposite end portions connected by a connector to a flexible tilt member and in which the connector includes a fastening portion for fastening the same to the end of a slat, a pivot portion and a pair of tilting arms extending radially from the pivot portion for connection to the flexible tilt member, the improvement in which the point of connection of the tilt member to one of said arms is such that in the closed position of the slats such point of connection is offset laterally of the blind with respect to the plane containing the axes of the pivot portions of the slats



whereby the weight of each slat acting through the axis of its pivot portion tends to rotate the respective slat to and maintain the slat in the closed position, said lateral offset being achieved by arms extending from said pivot portion at an acute angle with respect to said plane, each of said arms has a pin extending outwardly therefrom adjacent the terminus thereof and in which there is a locking tongue on each arm for each pin, and each of said locking tongues being pivotable with respect to its associated arm into locking engagement with its associated pin.

4,187,898

MANDREL FOR USE IN CONTINUOUS CASTING OF HOLLOW INGOTS

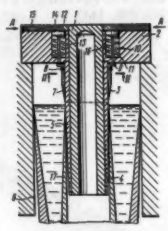
Anatoly I. Manokhin, ulitsa Metallurgov, 4, kv. 44; Anatoly G. Sitnov, ulitsa Metallurgov, 80a, kv. 42, both of Tula; Vitaly Y. Genkin, Sirenevy bulvar, 27, korpus 3, kv. 27, and Anatoly L. Liberman, mikroraion Teply Stan, korpus 65, kv. 259, both of Moscow, all of U.S.S.R.

Filed Mar. 1, 1978, Ser. No. 882,901

Claims priority, application U.S.S.R., Mar. 3, 1977, 2458622

Int. Cl.[2] B22D *11/04*

U.S. Cl. 164—421 **8 Claims**



1. The combination of a continuous casting mold, a support member associated with said mold for supporting a mandrel and a mandrel supported by said support member and depending into said mold to define a hollow casting cavity for continuously casting hollow ingots, said mandrel comprising: a hollow rod having one end fixed in said support member; a collar formed around said hollow rod including an upper portion and a tapered lower portion; said tapered lower portion being tapered in narrowing fashion in the direction along the length of said hollow rod and travelling away from said fixed end; a protective sleeve mounted around said collar for movement along the axis of said hollow rod; and drive means associated with said support and said sleeve for displacing the sleeve

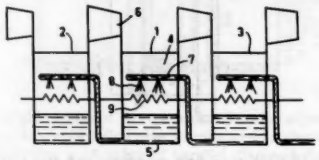
relative to the hollow rod and the collar and tapered portion combination.

4,187,899

METHOD AND APPARATUS FOR EXCHANGING HEAT BETWEEN FLUIDS

Jacques Sterlini, Paris, France, assignor to CEM-Compagnie Electro-Mecanique, Paris, France

Filed Mar. 7, 1978, Ser. No. 884,125
Claims priority, application France, Mar. 9, 1977, 77 07041
Int. Cl.[2] F28C *3/08*; F25B *7/00, 1/10*
U.S. Cl. 165—1 **24 Claims**



13. A method of exchanging heat in a balanced system between a plurality of circuits carrying fluids at different temperatures ranging from T_o to T_N with a minimum expenditure of work, comprising the steps of:

providing a plurality of stages arranged in series, each stage operating in a corresponding one of a corresponding plurality of bounded temperature intervals T_o to T_1, T_1 to $T_2, \ldots T_{N-1}$ to T_N, the temperature intervals covering all of the range from T_o to T_N, the stage operating in the interval T_o–T_1 being of lowest rank, the stages operating in the intervals in the range T_1–T_{N-1} being of intermediate rank, and the stage operating in the interval T_{N-1}–T_N being of highest rank, each stage including at least one cell communicating with adjacent stages of higher and lower rank for transferring the liquid and vapor between the cells of stages of higher and lower rank;

circulating a transfer fluid as both a liquid and a vapor between the plurality of stages;

maintaining a pressure differential between each pair of adjacent stages;

heating the transfer fluid in at least one cell with at least a first working fluid circuit;

cooling the transfer fluid in at least one cell with at least a second working fluid circuit;

adjusting a fluid flow in a third circuit to control overall thermodynamic equilibrium of the heat exchanges.

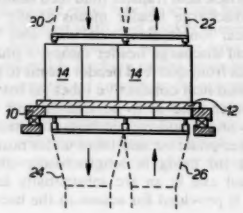
4,187,900

REGENERATORS

Joseph K. Pereira, and Martin White, both of Kingston-upon-Thames, England, assignors to British Steel Corporation, London, England

Filed Oct. 26, 1977, Ser. No. 845,670
Int. Cl.[2] F28D *19/04*
U.S. Cl. 165—8 **12 Claims**

1. A heat exchanger of the regenerative type for transfering heat from a hot gas to a cooler gas, said heat exchanger comprising: a matrix of heat storage elements having an under face for exposure to the cooler gas and an upper face for exposure to the hot gas, each element of the matrix comprising a ceramic heat storage block having a plurality of gas flow passages extending therethrough from end to end in the block; and a support structure including support bars and a frame member surrounding the matrix, the support bars passing through the matrix adjacent to, but behind, the under face of the matrix which in use is exposed to the cooler gas, said support bars being in turn supported by the frame member surrounding the matrix, the arrangement being such that in use the bars of the



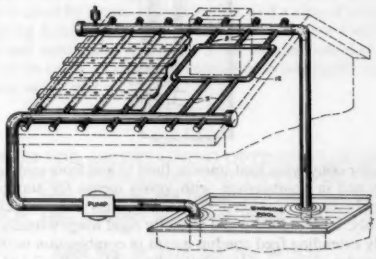
support structure are protected from damage by the hot gas which is supplied to the matrix.

4,187,901

FLAT PLATE SOLAR HEAT COLLECTOR

Robert A. Coleman, 753 Hanover St., Livermore, Calif. 94550, and Larry D. Beard, 256 Manitoba Green, Fremont, Calif. 94538

Filed Nov. 2, 1977, Ser. No. 847,707
Int. Cl.[2] F28F *1/22*; F24J *3/02*
U.S. Cl. 165—47 **4 Claims**



1. A heat exchanger for conveying heat energy to or from a fluid, comprising:

a panel which absorbs or emits heat, and which is cut to partially or completely surround an area which is not covered by the panel;

a plurality of tubes through which the fluid flows, the tubes being in thermally conductive contact with the panel;

means for constricting the fluid flow through each of the tubes, thereby regulating the flow rate in each tube;

channel means for conducting the fluid to and from the tubes;

means for impelling the fluid through the tubes; and

a common pipe running along the boundary of the uncovered area, the pipe being connected to each tube section which intersects this boundary.

4,187,902

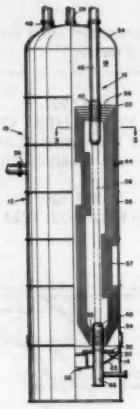
HEAT EXCHANGE APPARATUS

Clarence S. Miller, Jr., Kennett Square, Pa., and Richard A. Hager, Wilmington, Del., assignors to Hercofina, Wilmington, N.C.

Filed Oct. 13, 1971, Ser. No. 188,834
Int. Cl.[2] F28F *9/00*
U.S. Cl. 165—76 **3 Claims**

1. A transportable integral heat exchanger tube assembly for the interior of a chemical reactor for continuously carrying out a highly thermic chemical reaction involving liquid material, copious quantities of a gas and a reaction mixture comprising a readily precipitable substance that tends to deposit on heat

exchange tubes in contact with the reaction mixture under normal operative conditions, which reactor comprises vessel means for containing a body of said reaction mixture, which assembly comprises: heat transfer fluid feed header means; heat transfer fluid discharge header means axially aligned on a normally vertical longitudinal axis with and longitudinally spaced from said discharge header means; a plurality of heat conductive tubes from said feed header means to said discharge header means, said heat conductive tubes (a) having such high length to diameter ratio as to be flexible and vibratable by currents of gas and liquid in said body to thereby minimize deposition of precipitate on said tubes under normal operative conditions, and (b) being in longitudinally disposed radial planes about said axis in an arc substantially less than 360°, whereby space is provided for access to the back side of said



tubes; for conveying heat transfer fluid to and from said header means and in combination with vessel means for supporting and anchoring in position in said vessel means said integral tube assembly, longitudinally and laterally rigid longitudinally outwardly extending feed conduit means in combination with said feed header means, and longitudinally and laterally rigid longitudinally outwardly extending discharge conduit means in combination with said discharge header means; and rigid support means on said axis between and fastened to said feed header means and said discharge header means for minimizing longitudinal and transverse stressing of said heat conductive tubes in the fabrication, transportation and installation of said assembly, said rigid support means being removable from said feed header means and said discharge header means after said assembly has been installed in said vessel means.

4,187,903

CONDENSERS

Philip N. Judson, 27 Fincham's Close, Linton, Cambridge, England

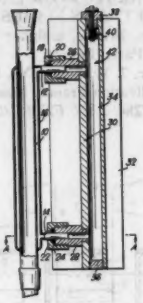
Filed Dec. 6, 1977, Ser. No. 857,969

Claims priority, application United Kingdom, Dec. 15, 1976, 52244/76; Jan. 14, 1977, 1613/77

Int. Cl.[2] F28B *1/02*

U.S. Cl. 165—76 **4 Claims**

1. Apparatus for condensing hot vapours and the like comprising an inner cylindrical member at least part of which comprises a condensing region including at least one surface on which hot vapours and the like may condense; an outer cylindrical member bonded at opposite ends to the said inner cylindrical member; the said inner and outer cylindrical members defining an annular region therebetween; at least one thermally conductive heat sink comprising a central web, having a fluid passage extending from one end to the other end thereof, and a plurality of cooling fins extending transversely therefrom to improve the cooling thereof; two connecting tubes communicating with the two opposite ends of the fluid passage in the central web and extending laterally therefrom to constitute pipe receiving members; inlet and outlet pipes extending laterally from the said outer cylindrical member and sealingly fitted



into the said pipe receiving members and the said annular region; the said inlet and outlet pipes, the said connecting pipes and the said fluid passage through the central web constituting a closed circuit adapted to be filled with a heat transfer liquid.

4,187,904

HEAT TRANSFER INSTALLATION HAVING STORAGE RESERVOIR CONTAINING A SALT AS A HEAT CARRIER

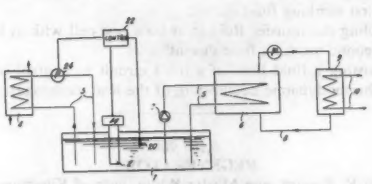
Hans Kühnlein, Füllinsdorf, Switzerland, assignor to Hch. Bertrams Aktiengesellschaft, Switzerland

Filed Oct. 27, 1977, Ser. No. 845,938

Claims priority, application Switzerland, Nov. 2, 1976, 13787/76

Int. Cl.[2] F28D *13/00*; **F24H** *7/00*; **F24D** *11/00*

U.S. Cl. 165—104 S **9 Claims**

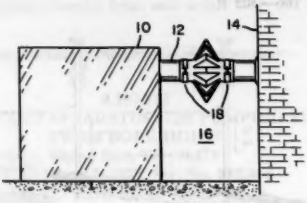


1. A heat transfer apparatus, comprising a storage reservoir, salt heat carrier disposed in said reservoir, heater means connected into said reservoir to heat said salt heat carrier so as to maintain it above its freezing point, a remote intermediate heat exchanger, means for circulating said salt heat carrier from said reservoir through said intermediate heat exchanger, intermediate heat carrier disposed in said intermediate heat exchanger, a remote consumptive heat exchanger, means for circulating said intermediate heat carrier through said consumptive heat exchanger and through said intermediate exchanger in heat exchange relationship with said salt heat carrier, a consumptive heat carrier disposed in said consumptive heat exchanger, and means for circulating a consumptive heat carrier through said consumptive heat exchanger in heat exchange relationship with said intermediate carrier.

4,187,905
ATTACHABLE PIPE RADIATOR

Raymond C. Isenberg, R.R. #1, Box 89, (Covedale) Williamsburg, Pa. 16693

Filed Nov. 14, 1977, Ser. No. 851,460
Int. Cl.[2] F28F 1/20
U.S. Cl. 165—181 8 Claims



1. A portable radiator device adapted to be adjustably attached to a thin-walled flue pipe, consisting of a single sheet of thin metal having a plurality of parallel diamond-shaped slits centrally positioned therein, comprising in combination:

a thin-walled flue pipe;

two mounting bases adapted to wrap circumferentially about said flue pipe perpendicularly to the mid-line of said flue pipe, said mounting bases comprised of the end portions of said single sheet of thin metal;

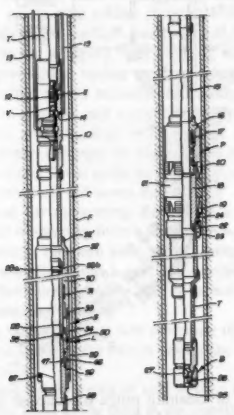
a plurality of fins extending outwardly and continuously between said mounting bases, said fins having an inwardly disposed V-shaped space therebetween;

securing means extending circumferentially about said mounting bases, perpendicularly to the mid-line of said flue pipe and adapted to secure said mounting bases to said flue pipe.

4,187,906
WELL BORE APPARATUS WITH ANNULUS PRESSURE RELEASABLE TUBING SEAL UNIT

Jozsef P. Kovacs, Lafayette, La., assignor to Baker International Corporation, Orange, Calif.

Filed May 8, 1978, Ser. No. 903,787
Int. Cl.[2] E21B 23/04, 17/02
U.S. Cl. 166—120 13 Claims



1. Well bore apparatus adapted to be installed in a well casing for conducting produced well fluid to the top of the well, comprising: a tubing string extending into the casing; packer means in said tubing string having normally retracted expansible casing engaging anchor means and resilient packing deformable into sealing engagement with the casing; and a releasable sealing connector in said tubing string above said packer means; said connector including a pair of telescopically interengaged inner and outer tubular sealing bodies; one of said bodies being connected with said packer means and the other of said bodies being connected with the upwardly extended tubing string; releasable latching means retaining said bodies in a telescopically contracted condition; fluid pressure responsive release means operable responsive to the pressure of fluid in the casing above said packer means to release said latching means enabling telescopic extension of said bodies; and means responsive to manipulation of said tubing string to release said latching means.

4,187,907
WATERFLOOD METHOD USING SURFACTANTS

H. Robert Froning; William W. Owens, both of Tulsa, Okla., and Duane L. Archer, Dallas, Tex., assignors to Standard Oil Company (Indiana), Chicago, Ill.

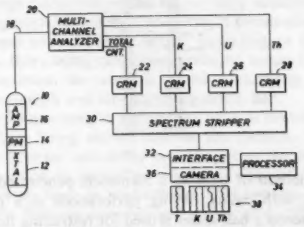
Continuation of Ser. No. 810,129, Jun. 27, 1977, abandoned.
This application Aug. 21, 1978, Ser. No. 935,412
Int. Cl.[2] E21B 43/22
U.S. Cl. 166—275 22 Claims

1. A method for improving the sweep efficiency of an oil recovery waterflood comprising injecting into an earth formation having at least one stratum of the formation which contains water-sensitive clays and has a higher permeability than another stratum of said formation that does not contain water-sensitive clays by means of an injection well a slug of floodwater having salinity substantially the same as native formation water and containing surfactant in an amount less than that required to cause a substantial reduction in interfacial tension between water and oil.

4,187,908
METHOD FOR ASCERTAINING OPTIMUM LOCATION FOR WELL STIMULATION AND/OR PERFORATION

Walter H. Fertl, Houston, and Donald B. Vaello, San Antonio, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 29, 1978, Ser. No. 947,132
Int. Cl.[2] E21B 47/00, 47/05; G01V 5/00
U.S. Cl. 166—254 5 Claims



1. A method for determining the optimum location along the length of a borehole penetrating an earth formation for instituting well stimulation operations, comprising the steps of:

transversing the borehole penetrating the earth formation with a logging instrument having a gamma ray detector;

detecting natural gamma radiation occurring in the earth formation in the vicinity of the borehole and generating signal functionally and depth-point related to the energy and frequency of occurrence of such gamma radiation;

separating said signals into at least three energy regions corresponding to gamma radiation produced by naturally occurring radioactive isotopes of potassium, uranium and thorium occurring in said earth formations at said related depth-point.

processing said separated signals for producing individual count signals each representative of radiation occurring in each of said at least three energy regions at said relative depth-point;

combining the count signals representative of at least one of such energy regions corresponding to gamma radiation produced by radioactive isotopes of potassium and thorium with said remaining energy region count signals corresponding to gamma radiation produced by radioactive isotopes of uranium for deriving a differential signal; and

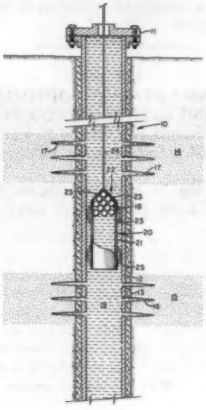
comparing said differential with a preselected reference signal for determining optimum stimulation locations and at said depth-point location as indicated by said differential signal exceeding said preselected reference signal.

4,187,909

METHOD AND APPARATUS FOR PLACING BUOYANT BALL SEALERS

Steven R. Erbstoesser, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Nov. 16, 1977, Ser. No. 852,173
Int. Cl.[2] E21B *33/10, 33/13*
U.S. Cl. 166—284 **6 Claims**



1. A method of treating a formation penetrated by a well provided with casing having perforations at a plurality of levels wherein a ball sealer is used for restricting flow through a lower perforation while leaving an upper perforation open to fluid flow comprising

lowering to a level between said upper perforation and said lower perforation a ball sealer having a size sufficient to plug the lower perforation and having a density less than the density of a treating fluid used in treating said formation;

lowering screen means between said upper perforation and said lower perforation and above said ball sealer adapted to keep said ball sealer below the screen means and to permit downward flow of fluid through said screen means to carry said ball sealer downward with said fluid; and

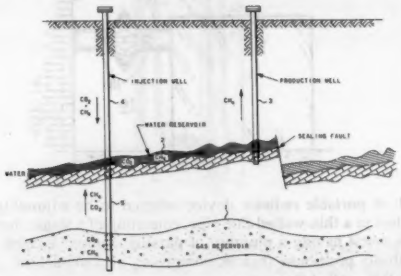
injecting a treating fluid into the casing to cause fluid flow through said upper perforation and through said screen means to carry said ball sealer to said lower perforation.

4,187,910

CO_2 REMOVAL FROM HYDROCARBON GAS IN WATER BEARING UNDERGROUND RESERVOIR

Archie J. Cornelius, and Riley B. Needham, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 4, 1978, Ser. No. 893,364
Int. Cl.[2] E21B *43/00*
U.S. Cl. 166—305 R **8 Claims**



1. A method for decreasing the CO_2 content of hydrocarbon gas, said method comprising:

(1) injecting hydrocarbon gas containing CO_2 into a water bearing zone of an underground formation,

(2) dissolving CO_2 in the water zone,

(3) collecting CO_2-depleted hydrocarbon gas in another permeable portion of the formation, and

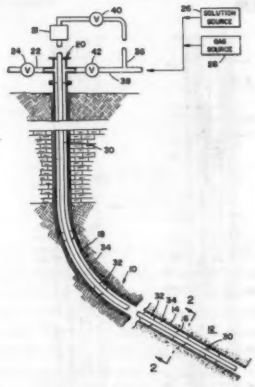
(4) producing hydrocarbon gas reduced in CO_2 content from said other permeable portions of the formation.

4,187,911

SLANT HOLE FOAM CLEANOUT

Stanley O. Hutchison, Bakersfield, and Glenn W. Anderson, Oildale, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Mar. 29, 1978, Ser. No. 891,417
Int. Cl.[2] E21B *21/00*
U.S. Cl. 166—312 **5 Claims**



1. A method of cleaning out a directional well, said well having more than about 15° deviation from the vertical over a substantial portion of its depth comprising running into a directional well having well conduits positioned therein a string of clean-out tubing of smaller outside diameter than the inside diameter of the well conduits, centralizing said clean-out tubing in coaxial alignment within said well conduits in said well

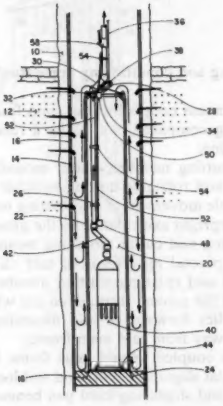
to provide an inner passageway from the surface through the interior of said clean-out tubing and an annular passageway between the outside of said clean-out tubing and said well conduits in said well, injecting a gas and liquid foam having a gas-to-liquid ratio of between 10 SCF/m and 30 SCF/m per gallon down one of said passageways and continuing to inject said foam down said one of said passageways and up the other of said passageways at a circulation rate of at least 30 feet per minute to remove material from said well.

4,187,912

METHOD AND APPARATUS FOR PUMPING FLUIDS FROM BORE HOLES

Robert L. Cramer, Rising Star, Tex. 76471

Filed Nov. 17, 1977, Ser. No. 852,463
Int. Cl.[2] E21B *43/00, 47/04, 47/12*
U.S. Cl. 166—314 **20 Claims**



1. Pumping apparatus for pumping fluid from a bore hole in a fluid producing formation to the surface comprising: sump means for receiving said fluid from the bore hole positioned in said bore hole; production tubing through which fluid in the bore hole travels to the surface; pumping means positioned in said sump means for pumping fluid entering said sump means through said production tubing to the surface for recovery; and pump actuating means activated by the fluid level in said sump means for starting and stopping the operation of said pumping means; whereby fluid entering said bore hole from the formation passes through the sump means on its way to the surface and the liquid level in the bore hole is controlled by the vertical positioning of said sump means.

15. A method for recovering fluid from a bore hole into which said fluid is entering from a formation while controlling the level of fluid in the bore hole, which comprises:

(a) flowing said fluid into a vertically adjustable container for said fluid positioned in the bore hole and having a pump positioned therein;

(b) pumping said fluid from said container to the surface at a rate at least equal to the rate at which the fluid is entering the bore hole;

(c) controlling the pumping of said fluid to begin the pumping at a first level of the fluid in the container and to cease the pumping when said fluid has sunk to a second level in said container below said first level, and

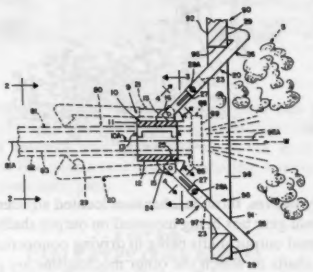
(d) vertically positioning said container in the bore hole to provide a substantially optimum level of fluid in the bore hole.

4,187,913

FIREHOSE-ASSEMBLY STEADYING DEVICE

Dwight E. Wilcox, Omaha, Nebr., assignor to Wilcox Silent Nozzle Man, Inc., Omaha, Nebr.

Continuation-in-part of Ser. No. 791,785, Apr. 28, 1977, abandoned. This application Apr. 24, 1978, Ser. No. 899,063
Int. Cl.[2] A62C *33/04*; F16L *5/00*
U.S. Cl. 169—51 **13 Claims**



1. In combination with the leadward portion of a firehose-assembly including a firehose tubularly surrounding a hose-axis and a nozzle for the directionally forward emission of a waterstream from the nozzle front-side, a firehose-assembly steadying device adapted to constructionally employ waterstream backpressure for stably maintaining the nozzle aptly located at a wall opening for the intended firemanship task, said steadying device comprising:

A. collar means surrounding the hose-axis and secured to the firehose-assembly rearwardly of the nozzle front-side;

B. a plurality of elongate wings associated with the collar means and each wing having a near-end and a far-end, each wing having an inoperative ready-condition and an operative abutment-condition, each wing at ready-condition lying generally parallel to the hose-axis whereby the near-end and the far-end are alongside the firehose leadward-length, each wing at abutment-condition being markedly oblique the hose-axis and having its near-end at the collar means and its far-end positioned remotely radially outwardly from the collar means, and at least one of said wings comprising a pair of movably associated elongate segments including a near-length terminating at the wing near-end and a far-length extending to the wing far-end, there being movement arresting means to temporarily maintain the selected spatial relationship between the near-length and far-length segments; and

C. forwardstop means to prevent the wing at abutment-conditon from being moved toward the firehose, said forwardstop means actuatably extending from the wing nearward portion to the collar means and thereat remaining effective so long as waterstream backpressure tends to force the firehose-assembly and the secured collar means in the rearward direction.

4,187,914

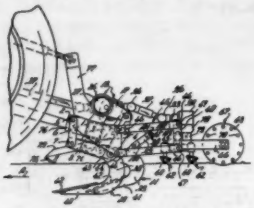
SOIL CULTIVATING IMPLEMENTS

Cornelis van der Lely, 7 Brüschenrain, Zug, Switzerland

Filed Sep. 26, 1977, Ser. No. 836,774
Claims priority, application Netherlands, Oct. 1, 1976, 7610861
Int. Cl.[2] A01B *11/00, 19/06*
U.S. Cl. 172—53 **14 Claims**

1. A soil cultivating implement comprising a frame and a plurality of soil working members pivoted on said frame in a row that extends transverse to the direction of travel, said members having tools located adjacent one another in working positions and driving means connected to said members to

repetitively pivot said tools upwardly and downwardly to work adjoining strips of soil, said driving means comprising a central gear box and respective eccentric mechanisms engaged by shaft means turned by gears in said box, said mechanisms being mounted on separate shafts which are drivenly interconnected by sleeves, those mechanisms located adjacent opposite sides of said gear box being mounted on output shafts from said box and said output shafts being in driving connection with the separate shafts to which the other mechanisms are connected, said gears being connectable to a power take-off shaft of a tractor to which said implement can be coupled.



4,187,915

SOIL CULTIVATING IMPLEMENTS

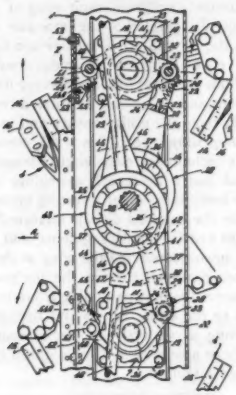
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Dec. 27, 1977, Ser. No. 864,471

Claims priority, application Netherlands, Dec. 29, 1976, 7614518

Int. Cl.[2] A01B *33/06*

U.S. Cl. 172—59 **17 Claims**



1. A soil working implement comprising a frame and a plurality of soil working members being supported on the frame, said members each being rotatable about respective shafts and a transmission having intermittent drives connected to periodically rotate said shafts, said transmission comprising a common rotary input shaft and reciprocable drive connectors extending to each side of eccentric mechanisms mounted on said input shaft, one above the other, the respective shaft of each working member mounting a ratchet wheel and a drive pawl that interconnects one of the connectors to said ratchet wheel, a non-return pawl being pivotally mounted adjacent said wheel to prevent rotation of said shaft in one direction.

4,187,916

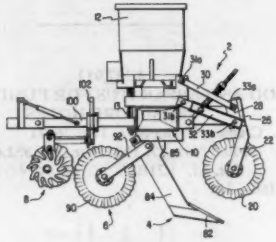
SOIL CONDITIONING AND SEED BED PREPARING APPARATUS

Jerrell W. Harden, Banks, and William P. Brown, Ozark, both of Ala., assignors to Brown Manufacturing Corporation, Ozark, Ala.

Filed Oct. 13, 1977, Ser. No. 841,954

Int. Cl.[2] A01B *13/08, 49/02*

U.S. Cl. 172—146 **83 Claims**



1. Soil preparing and conditioning apparatus, comprising:

a main frame,

soil loosening means coupled to the main frame for cutting and loosening compacted soil along a relatively narrow track, including:

a rotatable cutting member, cutter mounting means for mounting said rotatable cutting member to said frame for pivotable movement of said cutting member about a generally upright axis relative to the ground plane, and

means coupling said cutter mounting means to said main frame for pivotal movement of said cutter mounting means and said rotatable cutting member toward and away from the ground through an arc whose center of curvature lies forward of said mounting means in a direction away from said main frame;

subsoiler means coupled to said main frame behind and in substantial axial alignment with said soil loosening means for breaking and shattering hard pan beneath the surface of the ground;

slot filler means coupled to said main frame behind and in substantial axial alignment with said subsoiler means for filling a slot in the soil left by the forward motion of said subsoiler means therethrough; and

seed bed preparation means coupled to said main frame behind said slot filler means for pulverizing the soil in and adjacent the region of the filled in slot behind the slot filler means, said seed bed preparation means including:

soil chopping means, and

means mounting said soil chopping means to said main frame for substantially universal axial, angular and lateral adjustment relative to said filled in slot.

4,187,917

PILE DRIVER

John V. Bouyoucos, Rochester, N.Y., assignor to Hydroacoustics, Inc., Rochester, N.Y.

Filed Nov. 30, 1977, Ser. No. 856,059

Int. Cl.[2] B25D *9/00*

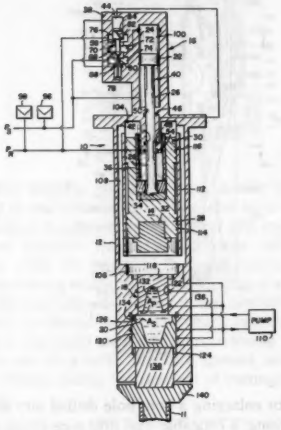
U.S. Cl. 173—131 **14 Claims**

1. In a pile driver having a housing adapted to be placed upon the pile to be driven, a ram mounted for reciprocating movement in said housing with means for repetitively driving said ram in forward and return strokes toward and away from said pile, apparatus which permits the ram weight to be reduced, the ram velocity to be increased and the driving power applied to the pile, expressed as the product of the blow energy and repetition frequency of the ram, to be increased without increasing the force tending to lift the housing off the pile during the downward acceleration of said ram, said apparatus

comprising a hydraulic spring-transformer disposed in said housing between said ram and said pile for receiving repetitive impacts from said ram and transferring force pulses due to said impacts to said pile and for transforming the higher impact velocity of said ram to a lower impact velocity as imparted to said pile, said hydraulic transformer comprising a first piston and a second piston which define a variable volume chamber, said chamber containing hydraulic fluid and providing said hydraulic spring, said first piston being disposed adjacent said ram for receiving said impacts therefrom and said second piston being disposed between said first piston and said pile for transferring said impacts received from said first piston via said hydraulic spring to said pile, said chamber having such a volume that the Q of said spring, loaded by the characteristic impedance of the pile, is less than about 1 where

$$Q = R_{AP}\omega_P C,$$

and



$$R_{AP} = (P_L c_L A_L / A_S^2)$$

where P_L is the density of the pile, c_L is the velocity of sound in the pile, A_L is the area presented by the pile to the housing, and A_S is the said area presented by said second piston to said chamber,

$$C = V/B,$$

where

V is the volume of the chamber and B is the bulk modulus of the hydraulic fluid in said chamber, and ω_P is the resonant frequency in radians per second where

$$\omega_P^2 = (B/V)(A_P^2/M_R[1 + (M_R/M_H)(A_S/A_P - 1)^2]$$

where A_P is said area presented by said first piston to said chamber, M_R is the mass of the ram and M_H is the mass of the housing.

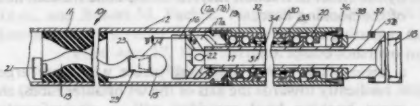
4,187,918

DOWN-HOLE EARTH DRILLING MOTOR CAPABLE OF FREE CIRCULATION

Wallace Clark, 1830 S. German Church Rd., Indianapolis, Ind. 46239

Filed Jun. 12, 1978, Ser. No. 914,776
Int. Cl.² E21B *13/00, 1/06*
U.S. Cl. 175—39 **12 Claims**

1. In a hydraulic down-hole earth drilling motor of the helical gear pair type, having a transmission from said motor to a drill bit, comprising an extension from the inner helical gear having a socket on the lathe axis thereof, and a ball having a shank secured in said socket, and a half-tube associated with the drill bit and being diametrically disposed with respect to the hole, said ball extending into said half-tube, means for



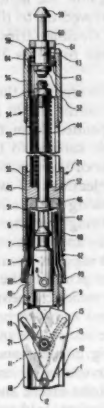
withdrawing said motor and ball to the extent that said ball comes out of engagement with said half-tube to permit fluid to be pumped through said motor for clean-out mud density build-up and like purposes without producing rotation of said bit and its associated parts.

4,187,919

CABLE-TYPE CORE BARREL

Honore J. Lambot, Wauthier-Braine, Belgium, assignor to Diamant Boart, Brussels, Belgium

Filed May 3, 1978, Ser. No. 902,603
Claims priority, application Belgium, May 3, 1977, 177239
Int. Cl.² E21B *9/20*
U.S. Cl. 175—246 **9 Claims**



1. A cable-type core barrel comprising:
a set of outer tubes,
a drilling bit provided on the lower end of the set of outer tubes,
an annular suspension ledge provided on the set of outer tubes,
an annular locking groove provided on the set of outer tubes,
an inner tube,
an extractor cone provided at the lower end of the inner tube,
an annular rim provided on the inner tube and bearing against the annular suspension ledge in a lower boring position of said inner tube,
a hooking head provided at the upper end of the inner tube,
an upper cone frustum provided on the hooking head,
a release cone provided on the hooking head,
a latch with tongues provided on the inner tube for locking it in the set of outer tubes by engaging said tongues in the annular locking groove,
a tubular latch support for carrying the latch, said latch

support being rigid with the inner tube and having no effect on the release of said inner tube,

a release slide provided rigid on the hooking head,

a release pin provided on the release slide and sliding in the latch support and relative thereto, said release pin disengaging the latch tongues from the annular locking groove by the effect of traction exerted on the cone frustum hook of the hooking head,

an operating cable,

an overshot comprising:

a lower clamp comprising nose pieces which are urged resiliently towards the axis of the set of outer tubes, and upper hooking head provided with a circumferential hooking groove and comprising mounting means for a cable connector,

an inshot comprising:

a lower bell member slotted longitudinally to form radially flexible strips, the ends of which are provided with hooking projections, the bell member being mechanically connected to a rod or the like extending axially upwards,

an upper hooking head comprising an upper cone frustum hook, the hooking head being rigid with an intermediate tube or the like which extends axially downwards about the axial rod connected to the lower bell member,

a helical spring housed in the intermediate tube about the axial rod and resting against an upper support provided on the axial rod and a lower support provided on the intermediate tube, the axial rod and intermediate tube being thus able to slide axially relative to each other both with and against the helical spring, and

a threaded ring screwed on to the intermediate tube and surrounding the flexible strips of the bell member to selectively prevent or allow their radial extension by bending,

the inner tube being lowered into the core boring position by being suspended from the inshot alone or from the inshot which itself is suspended from the overshot, the inshot being hooked at the surface to the latch support of the inner tube by means of the flexible strips of its bell member, the lower projections of which are engaged in a circumferential hooking groove in the latch support, said flexible strips then being prevented from bending towards the set of outer tubes and releasing their hooking projections from the latch support because of the threaded ring disposed in its lower position, the overshot being hooked at the surface to the inshot by means of the nose pieces and its clamp, which hook onto the cone frustum hook of the hooking head of the inshot, the inner tube, when brought into the core boring position and locked therein, being released from the overshot by traction exerted upwards on the inshot, or on the inshot and the overshot and thus transmitted to the inshot, said traction firstly lifting the hooking head from the inshot together with the intermediate tube and threaded ring without lifting the bell member and axial rod and compressing the helical spring, the threaded ring on being raised releasing the flexible strips of the bell member, the lower projections of which disengage from the hooking groove of the latch support, while not affecting the release, so as to cause the inner tube to disengage and the inshot to be subsequently raised while remaining suspended from the operating cable or from the overshot, while leaving the inner tube in place, the inner tube, when provided with a core and released, being raised from its core boring position by being suspended from the overshot which is itself suspended from the inshot, the overshot being hooked inside the set of outer tubes to the hooking head of the inner tube by means of the nose pieces and of its clamp, which are hooked onto the cone frustum hook of the hooking head of the inner tube, the inshot being previously hooked at the surface to the overshot by the flexible strips of its bell member, the lower projections of which are engaged in the hooking groove in the hooking head of the overshot, said flexible strips then being prevented from releasing their lower projections from the hooking groove by the threaded ring which is then placed in its lower position, the inshot not causing its helical spring to deform to any extent capable of releasing its bell member from the overshot during the lifting of the inner tube except in the case of accidental resistance to said lifting, in which case the inshot disengages from the overshot without breaking the operating cable.

4,187,920

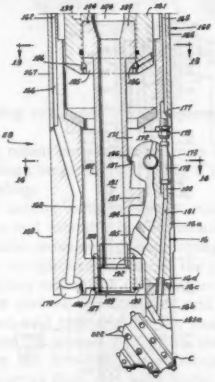
ENLARGED BORE HOLE DRILLING METHOD AND APPARATUS

Gary R. Johnson, Yorba Linda, Calif., assignor to Tri-State Oil Tool Industries, Inc., Bossier City, La.

Filed Nov. 23, 1977, Ser. No. 854,132

Int. Cl.[2] E21B *9/26*

U.S. Cl. 175—267 **28 Claims**



1. Apparatus for enlarging a bore hole drilled into an earth formation comprising: a rotatable dual drill pipe string having an inner pipe and an outer pipe defining an inner fluid path and an outer fluid path between the pipes; a bit body having normally retracted expansible cutter arms having rotary cutters on the free ends of said arms, said body being connected to said drill pipe string and having an opening for communicating between the bore hole and said inner fluid path; fluid pressure actuated means for expanding the cutter arms of said bit; passage means for communicating said fluid pressure actuated means and said bore hole with said outer fluid path; and means for connecting said outer fluid path to a fluid source while permitting rotation of said drill pipe string; said passage means including first passage means leading from said fluid pressure actuated means through said expansible cutter arms to said cutters and second passage means leading from said fluid pressure actuated means through said body and having nozzles directed towards said cutters.

4,187,921

ROCK BIT COMBINATION TO ENHANCE CUTTINGS REMOVAL

Lloyd L. Garner, San Clemente, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Dec. 1, 1978, Ser. No. 965,647

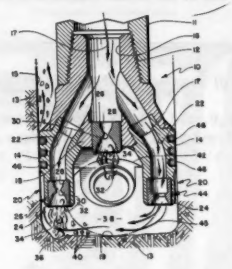
Int. Cl.[2] E21B *9/08;* **E21C** *7/06*

U.S. Cl. 175—340 **2 Claims**

1. In a two cone extended nozzles rock bit, said bit comprising a pair of extended nozzle legs attached to said bit with a third center jet nozzle in the dome of said bit, wherein said rock bit utilizes the hydraulic action of circulating drilling mud by directing the mud through said nozzles toward the bottom

of a hole to aid the process of advancing the bit in said hole, the improvement which comprises:

at least one cavitating jet nozzle body in said rock bit, said body having a first upstream opening formed by said body smaller than a second downstream exit opening, the axis of said nozzle being substantially aligned with the axis of said bit, said body further defining a throat section positioned between said first and second opening, said throat having an opening smaller than said first upstream opening, said throat section being positioned closer to said upstream opening than said downstream exit opening, the diverging walls formed by said nozzle downstream of said throat form a



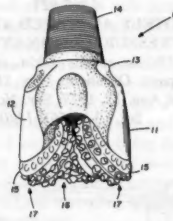
chamber thereby, said at least one nozzle body when subjected to said circulating drilling mud induces cavitation of the mud as it exits past said throat of said nozzle, one of said pair of extended nozzle legs contains said cavitating jet nozzle while the opposing extended nozzle leg contains a non-cavitating nozzle which emits liquid at a higher pressure than the cavitating liquid that passes through said cavitating nozzle, the lower pressure adjacent said cavitating nozzle induces the liquid from said non-cavitating nozzle to move across the rock-tooth interface toward said low pressure area thereby aiding the removal of cuttings from said hole bottom.

4,187,922

VARIED PITCH ROTARY ROCK BIT

Francis E. Phelps, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed May 12, 1978, Ser. No. 905,256
Int. Cl.[2] E21C *13/02*
U.S. Cl. 175—374 **10 Claims**



1. A method of constructing a rotary rock bit having a bearing pin and at least one rolling cutter member rotatably mounted on said bearing pin for forming a borehole in the earth, said rolling cutter member having at least one annular row of cutting elements on the cutter member for cutting portions of the borehole, comprising the steps of:

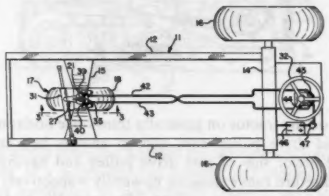
providing at least one annular row of cutting elements encircling said cutter member for cutting portions of the borehole with spaces between adjacent cutting elements, and positioning said cutting elements on said cutter member in said annular row so that substantially all of said spaces between adjacent cutting elements are unequal.

4,187,923

GUIDE WHEEL POSITION INDICATING APPARATUS

Maxwell D. McClure, III; William D. Lester, both of Memphis, Tenn., and Robert M. Fachini, Naperville, Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Apr. 17, 1978, Ser. No. 896,865
Int. Cl.[2] B60Q *1/42*
U.S. Cl. 180—215 **3 Claims**



1. In a cotton harvester having a main frame including a rearwardly located transversely extending bolster beam integral therewith, a forwardly located operator's compartment mounted on said frame, including a steering wheel, a pair of laterally spaced front driving wheels supporting the forward portion of said main frame, a rear steerable guide wheel having a vertical pivot shaft pivotally mounted to said bolster beam near the transverse center thereof, and hydrostatic steering means for controlling the relative position of said guide wheel assembly relative to the line of travel of said cotton harvester, the position of said guide wheel assembly being mechanically independent of that of said steering wheel, the improvement comprising a member mounted against rotation on said vertical pivot shaft above said bolster beam, said member including a horizontal segmental portion axially displaced from but in electrical contact with the adjacent structure of said member, first and second contact arms mounted to but electrically insulated from said frame, said arms having contact tip portions located respectively adjacent the circumferential ends of said segmental portion such that upon said steerable guide wheel being in fore-and aft alignment with said line of travel, no contact is made between either of said contact arms and said segmental portion, and upon said steerable guide wheel being turned a predetermined amount out of fore-and-aft alignment, said segmental portion contacts only one of said first and second contact arms, and first and second lamps mounted at said operator's station and being electrically connected respectively independently to said first and second contact arms, said lamps further being electrically connected to a frame grounded vehicle battery located on said vehicle in such a manner that upon said steerable wheel being turned said predetermined amount out of fore-and-aft alignment and contacting one of said contacting one of said contact arms, the electrical circuit from the lamp associated with said one contact arm will become grounded through said pivot shaft to said frame whereby said lamp will be lit to indicate the direction in which said harvester will steer.

4,187,924

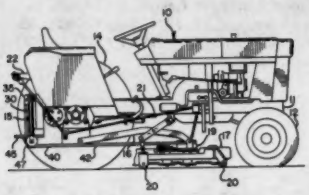
ROTARY MOWER BELT DRIVE

Joseph P. Deschamps, Naperville, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Oct. 2, 1978, Ser. No. 947,685
Int. Cl.[2] B60K *17/28, 25/06*
U.S. Cl. 180—53 R **4 Claims**

1. In a tractor having a rearwardly extending, clockwise-turning, power take off shaft and a rotary mower mounted by linkage to said tractor forwardly of said power take off shaft,

said mower having a clockwise rotating input pulley for receiving power from the tractor, the improvement wherein the apparatus for driving said mower from said power take off shaft comprises a drive pulley mounted on said power take off shaft, a pair of upper idler pulleys mounted on said tractor on horizontal axes above the axis of the drive pulley respectively on each side thereof, a pair of lower idler pulleys rotatably



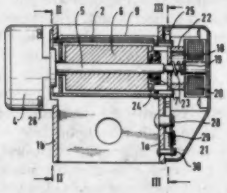
mounted on the tractor on generally transverse horizontal axes below said drive pulley axis, and an endless belt entrained about the lower side of said drive pulley and having its advance and return runs extending upwardly respectively to loop around said upper idler pulleys, downwardly respectively from said upper idler pulleys to said lower idler pulleys, and then forwardly respectively from said lower idler pulleys to entrain about said mower input pulley.

4,187,925

DEVICE FOR STRETCHING A BAND FORMING PART OF A SAFETY BELT FOR VEHICLES

Oskar L. Lindblad, Vargarda, Sweden, assignor to Autoliv AB, Vargarda, Sweden

Filed Jul. 21, 1977, Ser. No. 817,866
Int. Cl.[2] B60R *21/10*; A62B *35/00*
U.S. Cl. 180—268 **10 Claims**



1. In a device for tightening a safety belt for vehicles having power means activated by means for sensing abnormal changes in the movement of the vehicle, which power means upon activation will tighten the belt, the improvement comprising an inertial body member forming part of the power means, which body member under normal operating conditions of the safety belt is in a rotating condition, rotatable tightening means to tighten said belt upon abnormal changes in the movement of the vehicle, coupling means activated by said sensing means for connecting said rotating inertial body to said rotatable tightening means to tighten the safety belt when said abnormal changes in movement take place, thereby utilizing the energy of the rotating inertial body member for tightening of the belt.

4,187,926

LOUDSPEAKER HORN

Clifford A. Henricksen, Yorba Linda, and Mark S. Ureda, Woodland Hills, both of Calif., assignors to Altec Corporation, Anaheim, Calif.

Continuation-in-part of Ser. No. 810,642, Jun. 27, 1977, abandoned. This application Dec. 8, 1978, Ser. No. 967,739
Int. Cl.[2] G10K *11/00*
U.S. Cl. 181—192 **6 Claims**

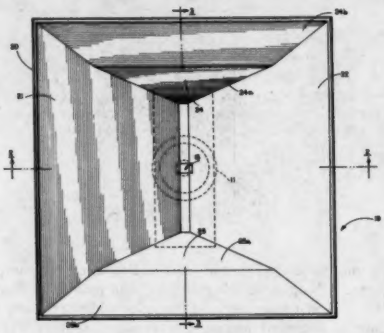
1. A loudspeaker horn for receiving and radiating acoustical energy with directivity control from an acoustical driver comprising:

a throat section connected to said driver having a rectangular transverse cross section and including a first pair of walls which are substantially parallel to each other, and a second pair of walls which diverge outwardly from each other from said driver at a predetermined angle,

the acoustical energy output of the driver being coupled to said throat section,

a rectangular mouth portion having a substantially greater perimeter than that of the greatest transverse cross section of said throat section,

a first pair of bell section walls which interconnect the first pair of walls of the throat section and the mouth portion,



and which diverge outwardly for the entire distance between said throat section and said mouth portion, and

a second pair of bell section walls which interconnect the second pair of walls of the throat section and the mouth portion and which diverge outwardly between the throat section and a point proximate to the mouth portion at the same angle as the second pair of throat section walls, the portions of said second pair of interconnecting walls connected to the second pair of throat section walls forming a continuum thereof,

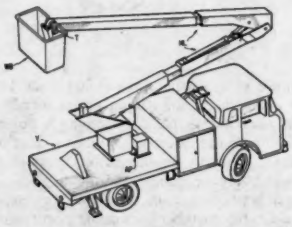
said first and second pairs of interconnecting walls being joined together along the edges thereof to form a flared bell section of said horn, said first pair of walls of said bell section diverging outwardly at a substantially greater angle than said second pair of bell section walls.

4,187,927

REMOTELY ACTUATED AUXILIARY PRESSURIZATION SYSTEM

James E. Byrne, Oklahoma City, Okla., assignor to UEC Manufacturing Company, Oklahoma City, Okla.

Filed Aug. 12, 1977, Ser. No. 824,231
Int. Cl.[2] B66F *11/04*
U.S. Cl. 182—2 **12 Claims**



1. A remotely actuated, battery-powered, auxiliary pressur-

ization system for the operation of the hydraulic circuit of a device having at least one hydraulically extensible arm independently of the major pressurizing means for said circuit, such means is the major power plant of the device, said arm having a work platform on one end with controls for said circuit, the other end of said arm being movably mounted on said device, said pressurizing system comprising an electrically powered motor/pump assembly connected to said circuit, a controller assembly for said motor/pump assembly and means in said controller assembly to receive activation and de-activation signals from a wireless transmitter mounted on said platform and having a self-contained power source to control the operation of said pressurizing system.

4,187,928

STEPLADDERS

Clayton E. Larson, Brooklyn, N.Y., assignor to White Metal Rolling & Stamping Corp., Brooklyn, N.Y.

Continuation-in-part of Ser. No. 775,850, Mar. 9, 1977, Pat. No. 4,079,814. This application Mar. 6, 1978, Ser. No. 883,578

Int. Cl.[2] E06C *1/18, 1/393, 7/14*

U.S. Cl. 182—124 **5 Claims**

1. A metal stepladder comprising a front section including left and right side rails, a top step and a plurality of spaced apart lower steps fixed between said side rails, each of said side rails and steps being channels having a face portion and two legs, the legs of the side rail channels extending inwardly of the sides of the ladder and the legs of the channels of the steps all extending downwardly relative to the upright position of the ladder,

a rear section pivoted to the front section comprising left and right side rails, each of said side rails being channels having a web portion and legs, and a plurality of spaced apart, horizontal brace members,

a pair of brackets fixed upon said rear section, each bracket comprising a flat base portion, a cylindrical bearing portion offset from said base portion and a connecting web portion integral with the base portion and bearing portion, the base portion of each bracket being fastened to one of the legs of a rear section side rail with the cylindrical bearing portion of the bracket between the legs of said rear section side rail and extending normally and inwardly of the face portion thereof,

a bucket rack comprising a pair of spaced apart, longitudinal members, said rack being pivoted on said rear section by a part of said cylindrical bearing portions of said brackets extending through openings in said longitudinal members, and

brace means on said front section comprising a pair of channel struts each having an angled lug at each end, one of said angled lugs being fixed to the undersurface of the lowermost step of the ladder and the opposed angled lug being fixed to the innersurface of the respective front section side rail at the lower end of such rail.

4,187,929

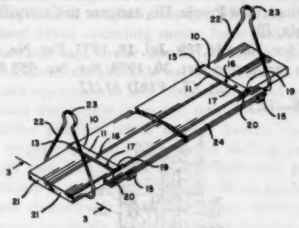
SCAFFOLD STABILIZER

Leonide A. Cyr, 912 Howard Ave., Bridgeport, Conn. 06605

Filed Aug. 3, 1978, Ser. No. 930,764

Int. Cl.[2] E04G *5/08, 7/28*

U.S. Cl. 182—222 **7 Claims**



1. A scaffold stabilizer adapted for use on a scaffold platform consisting of a multiplicity of longitudinal planks of uniform thickness assembled in side-by-side contact, said attachment comprising a generally C-shaped unitary metallic clamping member comprising elongate upper and lower plate members rigidly attached to a shorter end plate member so as to define an opening sufficiently wide and long to receive a multiplicity of planks in side-by-side contact with each other, said upper and lower plate members being provided with means for securing the ends thereof together at a point beyond the outer edge of the outermost plank contained therebetween, said upper plate member being longer than said lower plate member to provide an extension beyond said securing means adapted to support workpieces adjacent said scaffold, and said lower plate member being provided with an upward bow towards said upper plate member, said bow being adapted to provide an area of increased pressure on planks within said stabilizer attachment when said securing means is tightened.

4,187,930

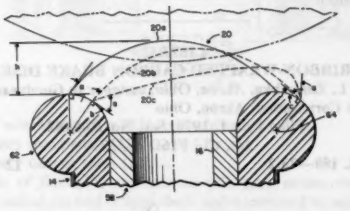
DISPENSING METHOD AND SYSTEM FOR LUBRICATING OIL AND OTHER LIQUIDS

Gordon E. James, Rancho Palos Verdes, Calif., assignor to TRW Inc., Systems & Energy, Redondo Beach, Calif.

Filed Apr. 27, 1978, Ser. No. 900,672

Int. Cl.[2] B05C *3/12;* **F01M** *9/00*

U.S. Cl. 184—1 R **22 Claims**



8. A liquid dispensing system comprising:

a liquid delivery head containing a liquid dispensing orifice opening at one end through the front end of said head,

a convex toroidal formation at said front end of said head about and having a toroidal surface circumferentially bounding said one end of said orifice,

liquid delivery means for supplying liquid to be dispensed to said orifice to form at said one end of the orifice a liquid droplet perimetrically contacting said toroidal surface, and

said toroidal surface being non-wettable by said liquid,

whereby said droplet and toroidal surface coact to produce on said droplet a self-centering action which resists displacement of said droplet laterally of said orifice.

4,187,931

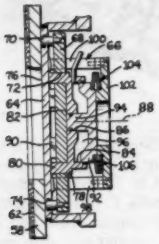
BRAKE HOUSING AND ACTUATING MECHANISM

David J. Balzer, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 816,789, Jul. 18, 1977, Pat. No. 4,134,478. This application Oct. 30, 1978, Ser. No. 955,865

Int. Cl.² F16D 65/32

U.S. Cl. 188—72.1 **3 Claims**



1. In a brake apparatus of the type including a case having a wall, a disc rotatably mounted in the case on an axis, and a braking member located between the disc and the wall, the improvement comprising:

a brake actuating assembly connected to the wall and having a second axis radially offset from the axis of said disc, said brake actuating assembly having a brake engaging member, a housing member, a piston and a support member;

said brake engaging member having a projection extendable through said wall against said braking member;

said housing member having an axially facing recess opening in a direction away from said wall and a through passage opening on said recess;

said piston having a cylindrical extension, said piston being received in said recess and defining a chamber therebetween, said piston having a retracted position against said support member and an extended position with said extension extending through said passage against said brake engaging member; and

said housing member being contactable with said wall and of a construction sufficient for nonrotatably containing said brake engaging member and permitting axial movement thereof.

4,187,932

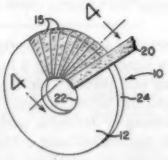
RIBBON-WRAPPED CARBON BRAKE DISK

Robert L. Zarembka, Akron, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed Feb. 1, 1978, Ser. No. 874,182

Int. Cl.² F16D 65/12

U.S. Cl. 188—73.2 **12 Claims**



1. A process for fabricating an annularly strengthened integral brake disk, comprising the steps of:

fabricating a brake disk core, having core faces;

impregnating a pyrolyzed carbon-containing ribbon of continuous uniform width with a bonding agent;

continuously wrapping said pyrolyzed carbon-containing ribbon completely about said core faces of said core in a sequential overlapping manner to form an outer layer; and

pyrolyzing said bonding agent to form an annularly strengthened integral brake disk.

4,187,933

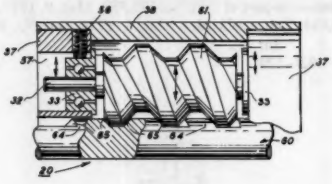
MECHANICAL SNUBBER ASSEMBLY

Richard A. Calabrese, Newtown, and Robert E. Fandetti, New Milford, both of Conn., assignors to Anchor/Darling Industries, Inc., Bala Cynwyd, Pa.

Filed Apr. 17, 1978, Ser. No. 897,101

Int. Cl.² B60T 7/12

U.S. Cl. 188—134 **5 Claims**



1. A mechanical snubber comprising:

(A) a housing incorporating

(a) a first portion

(b) a second portion slidably engaged with the first portion, and

(c) mounting means secured at the ends of both the first and second portions;

(B) a longitudinally-extending rack member

(a) fixedly mounted at one end thereof to the first portion of the housing,

(b) positioned for axial translation in response to relative movement between the first portion and the second portion of the housing, and

(c) incorporating a plurality of drive teeth axially arrayed along the rack member,

(d) each of said drive teeth being formed in the outer peripheral surface of the rack member, substantially parallel to adjacent drive teeth and extending in a direction substantially skewed to the central axis of the rack member, and

(e) each of said drive teeth having ramped, sloping sidewalls converging in the direction of the tooth apex;

(C) a worm gear

(a) rotationally mounted in the second portion of the housing,

(b) incorporating ramped, sloping sidewalls formed along the worm drive thread, with said sidewalls converging from bottom to top,

(c) radially moveable between a first position and a second position, and

(d) controllably engaged with the rack member for induced rotational movement and induced radial outward movement in response to the axial translation of the rack member, and

(D) biasing means

(a) engaging the worm gear,

(b) positioned for biasingly maintaining the worm gear in its first position for forces below a set level,

(c) responsive to forces exceeding the set level to allow the worm gear to move radially outwardly,

whereby relative axial sliding movement of the housing portions is converted into both rotary motion as well as radial

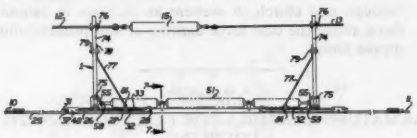
outward movement of the worm gear when the biasing force maintaining the worm gear in its first position is exceeded.

4,187,934

SECTION INSULATOR FOR CATENARY SYSTEMS

John W. Senften, Mansfield, Ohio, assignor to Harvey Hubbell, Incorporated, Orange, Conn.

Filed Jan. 13, 1978, Ser. No. 869,036
Int. Cl.[2] B60M *1/18, 1/22, 1/225*
U.S. Cl. 191—39 **14 Claims**



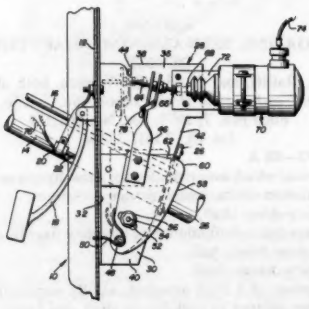
1. A section insulator assembly for mounting between spaced aligned ends of two contact wires of an overhead power supply of an electrified transportation system, there being a supporting cable above said contact wires, said assembly comprising main strain insulator means extending between the ends of the two contact wires at a level above the level of the contact wires, rigid means secured to each contact wire and to the adjacent ends of the strain insulator means, the strain insulator means being secured at a level above the level of the contact wires to the rigid means thereby to maintain the tension in the contact wires, a runner supported by and disposed at a level lower than said strain insulator means, and means extending downwardly from said supporting cable adjacent each end of said strain insulator means for supporting said assembly, said supporting means comprising a rigid supporting member rigidly secured to each of said rigid means and fixed to said supporting cable, whereby said rigid supporting members support said assembly and resist the turning moment imposed on the rigid means by reason of the offset between the axes of the contact wire and the strain insulator means, a pair of glider arms mounted at the ends of the contact wires, the glider arms in each pair extending laterally outwardly from the adjacent contact wire and extending longitudinally to overlap the ends of said runner, there being lateral air gaps between said runner and said glider arms.

4,187,935

BRAKE OPERATED SHIFT LOCK

Thomas R. O'Hern, 714 Glenridge Dr., West Palm Beach, Fla. 33405

Filed Feb. 28, 1978, Ser. No. 882,276
Int. Cl.[2] G05G *5/10;* **B60K** *29/02*
U.S. Cl. 192—4 A **6 Claims**



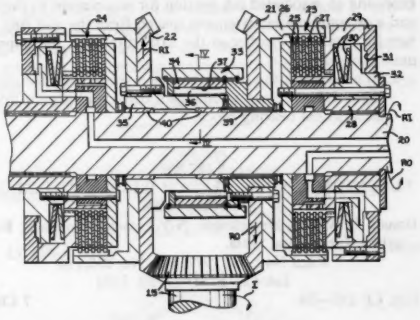
1. In combination with a vehicle including a steering column and gear selector means mounted on said column for movement between a non-drive position and a forward drive position, wheel brake operating means shiftable between brake applied and brake release positions, brake light operating electrical circuit means for actuating a brake light when closed and terminating operation of said brake light when open, means operatively connecting said wheel brake operating means and said electrical circuit means for closing the latter upon shifting of said wheel brake operating means from said brake release position toward said brake applied position, gear selector movement lock means shiftable between locked and unlocked positions and operative to lock and unlock said gear selector means against movement from said non-drive position to said forward drive position when in said locked and unlocked positions, respectively, and lock means shifting means operative to shift said lock means to said unlocked position and locked position in response to said circuit means being closed and opened, respectively, said lock means shifting means including means yieldingly biasing said lock means to said locked position and solenoid means operative to shift said lock means from said locked position to said unlocked position, latch means operative, independent of said lock means shifting means, for manually releasably latching said lock means in said unlocked position thereof, said gear selector means and said lock means including coacting means operative to cam said lock means from said locked position to said unlocked position and thereafter release said lock means for movement to said locked position upon movement of said gear selector means from said forward drive position to said non-drive position.

4,187,936

WINCH ASSEMBLY WITH ANTI-FALLBACK CLUTCH

Richard G. Davenport, Lowpoint, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 23, 1978, Ser. No. 918,233
Int. Cl.[2] F16D *11/04*
U.S. Cl. 192—21 **8 Claims**



1. A winch assembly (**11**) comprising:
a rotary input shaft (**15**),
a rotary output shaft (**20**),
a pair of first (**21**) and second (**22**) gear means rotatably mounted on said output shaft and connected to said input shaft for rotating in first and second opposite directions, respectively, upon rotation of said input shaft,
first (**23**) and second (**24**) clutch means for selectively connecting said output shaft to said first and second gear means, respectively, for establishing drive from said input shaft to said output shaft to rotate said output shaft in said first or second direction, respectively, and
means (**33**) interconnected between said first and second gear means (1) for permitting said first and second gear means to rotate in said opposite directions when said first clutch means is actuated to rotate said output shaft in said first direction, and (2) for normally permitting said first

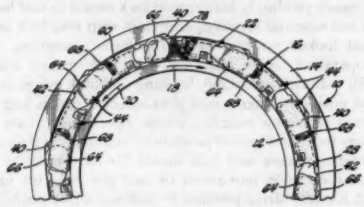
and second gear means to rotate in said opposite directions when said second clutch means is actuated to rotate said output shaft in said second direction, but for preventing said first and second gear means from rotating in said opposite directions when a torque load imposed on said output shaft tending to rotate said output shaft in said first direction exceeds a torque load imposed on said input shaft tending to rotate said second gear means in said second direction.

4,187,937

UNIT HANDLED ROLLER CLUTCH SUBASSEMBLY

Oscar G. Kitchin, Port Clinton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 31, 1978, Ser. No. 929,327
Int. Cl.[2] F16D *41/06*
U.S. Cl. 192—45 3 Claims



1. In a unit handled roller clutch subassembly having a sheet metal cage with a single end ring portion and a plurality of circumferentially spaced, integral tab portions extending in cantilevered fashion therefrom in an axial direction, a plurality of bearing blocks of low friction material having inner and outer bearing surfaces mounted on respective tab portions for centering inner and outer clutch races with respect to each other, each of said bearing blocks having a circumferential slot receiving an associated tab portion for securement to the cage and a circumferential extension spaced from the end ring portion for retaining a roller in the axial direction, the improvement comprising:

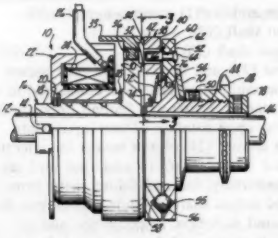
each of said bearing blocks having a second slot for mounting a tickler spring to engage a roller and urge it toward an adjacent bearing block.

4,187,938

ELECTROMAGNETIC CLUTCH WITH ANTI-JAM CAM ACTUATION

Donald L. Miller, Horseheads, N.Y., assignor to Facet Enterprises, Inc., Tulsa, Okla.

Filed Nov. 28, 1977, Ser. No. 855,114
Int. Cl.[2] F16D *27/10, 7/00*
U.S. Cl. 192—54 7 Claims



1. In an electromagnetic clutch including a rotatable first clutch member, an axially moveable ferromagnetic armature member, a rotatable second clutch member drivingly connected to said armature, and an electromagnetic coil means adapted to be energized to draw said armature axially into clutching engagement with said first clutch member, and also including torque responsive cam means mounted between said armature and said second clutch member to augment the electromagnetic engagement force between said armature and said input member upon engagement of said armature, the improvement comprising:

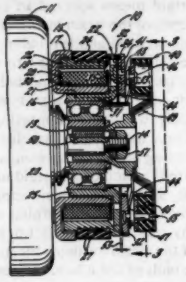
cam torque limit means mounted between said armature and second clutch member, said limit means preventing relative rotational movement between said armature and second clutch member above a predetermined torque limit through said clutch to prevent an increase in camming force above the cam force existing at said predetermined torque limit.

4,187,939

ARMATURE ASSEMBLY FOR ELECTROMAGNETIC COUPLING

Richard L. Silvestrini, Rockton, Ill., and Paul P. Newton, Beloit, Wis., assignors to Warner Electric Brake & Clutch Company, South Beloit, Wis.

Filed Dec. 14, 1977, Ser. No. 860,154
Int. Cl.[2] F16D *27/10*
U.S. Cl. 192—84 C 6 Claims



1. An electromagnetic coupling comprising an annular electromagnet and a relatively rotatable armature, said armature being drawn axially into engagement with said magnet when the latter is excited, resilient means acting on said armature and biasing said armature toward a position in which the armature is spaced from the magnet, and elastomeric means fixed axially relative to said magnet for frictionally retarding movement of said armature to reduce the force with which the armature strikes said magnet when the latter is excited, said elastomeric means frictionally retarding movement of said armature each time said armature is drawn into engagement with said magnet.

4,187,940

FREE FLOATING, SELF-ALIGNING SHAFT COUPLING DEVICE

William K. Ratliff, and Charles P. Warman, both of Wichita Falls, Tex., assignors to Dana Corporation, Toledo, Ohio

Filed Feb. 7, 1977, Ser. No. 766,234
Int. Cl.[2] F16D *25/04*
U.S. Cl. 192—88 A 2 Claims

1. A device which compensates for mis-alignment between drive and driven shafts, which device comprises;

(a) a rotary drive shaft,

(b) a rotary drive shaft alignment coupling fixedly secured to said rotary drive shaft,

(c) a rotary driven shaft,

(d) a portion of a fluid actuated, axially expansible clutch member secured to said driven shaft and being rotatable therewith,

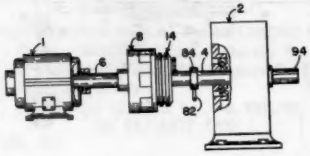
(e) a clutch friction disc member interposed between said

rotary alignment coupling unit and said axially expansible, fluid actuated clutch portion,

(f) said clutch portion of said fluid actuated, axially expansible clutch member being adapted to selectively engage said clutch disc member,

(g) a tubular member within said rotary shaft alignment coupling unit,

(1) a pair of inwardly extending hubs each secured respectively to said rotary shaft alignment coupling unit and to said clutch portion, each said hub being substantially in alignment with the respective drive and driven shafts, when in one position,



(h) said tubular member having at least one bearing seat formed therein,

(1) at least one self-aligning bearing within said bearing seat in said tubular member intermediate one of said hubs and said tubular member,

(i) said friction disc clutch member and said tubular member interconnecting said driven shaft and said drive shaft so as to compensate for limited mis-alignment between said driven shaft and said drive shaft, without

permitting longitudinal movement of one shaft relative to the other of said shafts, while permitting full torque to be transmitted from said drive shaft to said driven shaft.

4,187,941

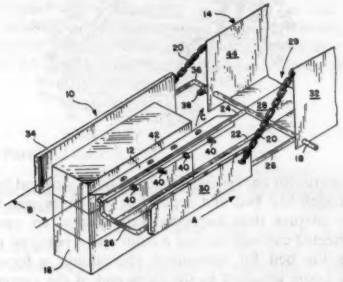
BALE RESTRICTIVE FLAP

E. Joel Martin, Narvon, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Jan. 5, 1979, Ser. No. 1,115

Int. Cl.² B65G *11/12*

U.S. Cl. 193—5 **4 Claims**



1. In a quarter-turn bale chute attachable to a hay baler, wherein an extension of a bale chamber is constructed with a partial support ledge from which a bale drops to the ground while rotating sideways off of the partial support ledge, and the bale is prevented from further rotation on the ground by an outrigger deflector positioned on the side of the quarter-turn bale chute remote from the partial support ledge, the combination thereof with a restrictive flap attached to and rotatable about the innermost upper edge of the partial support ledge.

4,187,942

TRANSFER BEAM CONVEYOR

Frederick G. Ward, Loughborough, England, assignor to Herbert Morris Ltd., Loughborough, England

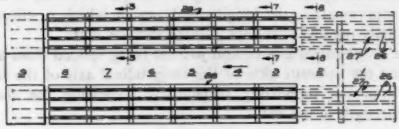
Continuation of Ser. No. 743,655, Nov. 22, 1976, abandoned.

This application Jun. 23, 1978, Ser. No. 918,425

Claims priority, application United Kingdom, Nov. 27, 1975, 48825/75

Int. Cl.² B65G *25/02*

U.S. Cl. 198—345 **7 Claims**



1. Apparatus for progressively fabricating relatively heavy articles comprising a stationary work supporting grillage having a series of successive work stations spaced therealong and divided longitudinally into a plurality of side by side passageways, rail means extending along each of said passageways, at least one carriage mounted for movement along each of said rail means, each carriage comprising a body mounting at least two adjustable jacks and a beam supported by the jacks, said beam extending along the associated passageway, means for actuating said jacks for vertically displacing said beam between a lowered position wherein it lies below an article structure in a work station and a raised position wherein it lifts that article structure up from the grillage at the work station preparatory to movement of the carriage to the next work station for further work thereon and means on each carriage body for guiding vertical movement of the associated beam, means on each carriage body providing fairing jacks adjustable for positionally engaging the article structure on the beam, individual drive means on each carriage body for driving the carriage along said rail means, whereby each carriage in a passageway may be positioned at a work station having article structure thereon, operated to engage and raise that article structure up off the fairing jacks and up from the grillage at that station, then driven to a succeeding station along the grillage and then lowered to deposit the article structure on the grillage for further work at that succeeding station.

4,187,943

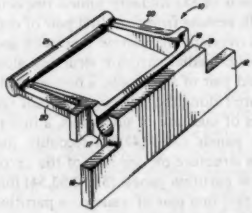
DRAG CHAIN LINKS

Edward J. Horkey, 835 W. 22nd St., Tempe, Ariz. 85282

Filed Nov. 15, 1978, Ser. No. 960,947

Int. Cl.² B65G *19/24, 19/08*

U.S. Cl. 198—730 **9 Claims**



1. A link for a drag chain comprising:

a material pushing blade having a substantially flat material engaging surface extending perpendicularly away from a supporting surface,

a connecting bar journal extending substantially parallel to and rearwardly of the supporting surface,

a journal slot extending upwardly and opening outwardly of said journal for receiving and guiding a connecting bar of an associated link into said journal,

said slot tilted rearwardly from said pushing surface to prevent accumulation of abrasive materials in said journal, and for easy removal of abrasive materials in links making up the return portion of the loop,

means comprising support arms extending rearwardly from said pushing surface out of contact with the supporting surface,

a connecting bar formed integral with the free ends of said support arms, the longitudinal axis of which is substantially parallel with said pushing surface, and

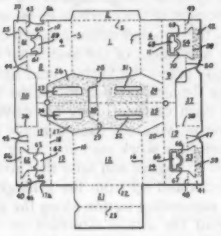
the longitudinal axis of said journal being spaced from and on the opposite side of the longitudinal axis of the link from the supporting surface for increasing the shear strength of the link.

4,187,944

ARTICLE CARRIER AND BLANK THEREFOR

Prentice J. Wood, Hapeville, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Mar. 19, 1979, Ser. No. 21,456
Int. Cl.[2] B65D *5/48, 75/00*
U.S. Cl. 206—187 **10 Claims**



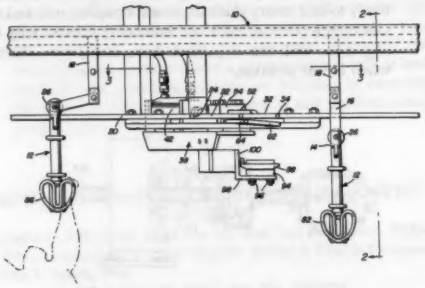
1. A collapsed article carrier comprising handle structure (24,25), medial partition structure (8,9,17,19) extending downwardly from said handle structure, a first pair of end wall panels (6,14) foldably joined to one end of said medial partition structure and disposed in overlapping relation therewith, a pair of side walls (1,12) foldably joined respectively to said first pair of end wall panels and being coplanar therewith, a second pair of end wall panels (4,13) foldably joined respectively to said pair of side walls remote from said first pair of end wall panels and disposed in overlapping relation therewith and being foldably joined to said medial partition structure along the edges remote from said pair of side walls, a bottom wall (21) folded in half and secured along the side edges thereof respectively to the lower edges of said pair of side walls, a first pair of transverse partition panels (39,40,41,42) foldably joined to said medial partition structure on one side of the carrier, a second pair of transverse partition panels (51,52,53,54) foldably joined respectively to said first pair of transverse partition panels and disposed in overlapping relation therewith, a pair of anchoring tabs (59,62,65,68) foldably joined respectively to said second pair of transverse partition panels and secured to the associated one of said side walls, and characterized in that one of said second pair of transverse partition panels is disposed in overlapping relation with the one of said anchoring tabs foldably joined to the other of said second pair of transverse partition panels.

4,187,945

PLURAL PATH WEIGHT SORTING SYSTEM

William F. Altenpohl, and Paul J. Altenpohl, both of High Point, N.C., assignors to W. F. Altenpohl, Inc., High Point, N.C.

Filed Jun. 29, 1978, Ser. No. 920,255
Int. Cl.[2] B07C *5/22*
U.S. Cl. 209—592 **21 Claims**



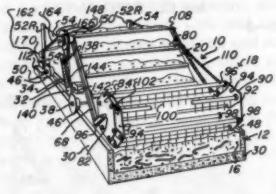
1. In combination with a conveyor moving a plurality of carriers through at least one monitoring station along a first path of travel, a weight sorting system including sensing means for detecting those of the carriers at said station loaded above a predetermined value, path changing means rendered operative for establishing a second path of travel along which the loaded carriers may be moved by the conveyor at said station, and control means responsive to said detection of the loaded carriers by the sensing means for rendering the path changing means operative to transfer movement of the loaded carriers from the first path to the second path of travel.

4,187,946

WORM HARVESTER

Walter A. Stevenson, R.F.D., Box 41, Oakley, Kans. 67748

Filed Nov. 1, 1978, Ser. No. 956,637
Int. Cl.[2] B07C *5/12*
U.S. Cl. 209—674 **10 Claims**



1. Apparatus for harvesting a mixture of worms and bedding from a trough-like bed and separating the large size worms from the mixture thus harvested comprising: an open-bottomed wheeled carriage having a front and a rear end mountable atop the bed for movement therealong; a forwardly-extending boom attached to the front end of the carriage for pivotal movement about a horizontally-disposed transverse axis between an elevated inoperative position and a lowered operative one riding in the bottom of the trough; reel means mounted on the end of the boom remote from the carriage for rotational movement about a horizontally-disposed transverse axis, said reel means having tines projecting therefrom effective upon rotation in a selected direction to rake a worm-bedding mixture laying in the bed rearwardly toward the carriage; first conveyor means carried by the boom positioned and adapted to receive the bedding mixture raked back by the reel means and raise same upwardly and rearwardly to a superim-

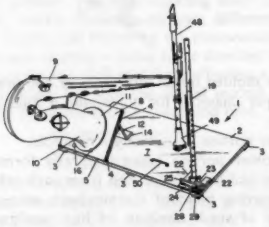
posed position above the front end of the carriage; a downwardly and rearwardly inclined screen extending from the front of the carriage to the rear thereof in position to receive the mixture delivered thereto by the first conveyor; means carried by said carriage and connected to said screen operative upon actuation to vibrate the latter, said screen and vibrator means being effective to return the small worms and small particles of bedding therethrough to the bed therebeneath while retaining the larger worms and bedding particles atop thereof; and second conveyor means on the rear end of the carriage extending transversely thereof in position to receive the worms and bedding retained atop the screen as they gravitate toward the lower end thereof.

4,187,947

COMBINATION MUSICAL INSTRUMENT STAND

Robert J. Dunn, 4495 Terrell Ln., Colorado Springs, Colo. 80908, and Sigifred Martinez, 3815 Vaquero Cr. North, Colorado Springs, Colo. 80918

Filed May 12, 1978, Ser. No. 905,390
Int. Cl.[2] A47F *7/00*
U.S. Cl. 211—13 **9 Claims**



1. A combination musical stand for various woodwinds including saxophone, flute, and clarinet, comprising a flat base, platform means on said base, said platform including means to support said saxophone, said platform being hingedly mounted on said base for angular tilting movement relative thereto for angularly and generally vertically supporting a saxophone, said platform being foldable against said base for storage, peg means on said base and spaced from said platform, said peg means being hinged at its lower end to said base so as to project vertically for receiving a flute thereon and being foldable to a horizontal position relative to said base for storage, and pyramidal shaped means removably positioned on said base in spaced relation to said platform and peg for vertically receiving a clarinet thereon, and said pyramidal shaped means being removed for flat stacking on said base for storage of the stand.

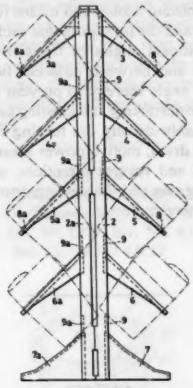
4,187,948

PILL-BOX DISPLAY STAND

Emilio Perrella, Viale S. Carlo, Segrate, Italy

Filed Mar. 1, 1978, Ser. No. 882,355
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1977, 7706644
Int. Cl.[2] A47F *7/28*
U.S. Cl. 211—71 **3 Claims**

1. A display stand, including two stand-halves for attachment to one another in back-to-back arrangement, said stand-halves each comprising two side posts and of a plurality of superimposed tiers arranged between said side posts and projecting forwardly and downwardly therefrom, each tier having a row of perforations for housing individual articles intended to rest on the underlying tier, said underlying tier being provided with upwardly extending tabs arranged below alternate perforations of the overlying tier to maintain corresponding articles housed in said alternate perforations at a higher level than those housed in the adjacent perforations, the locations of the tabs of one stand-half being alternated with the locations of the tabs of the other stand-half, the rear of the posts of each stand-half having projections and recesses arranged to engage with corresponding recesses and projections



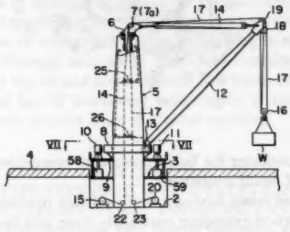
of the other stand-half when the two stand-halves are brought together in back-to-back arrangement.

4,187,949

DERRICK CRANE WITH WIDE HORIZONTAL SWINGING RANGE OF BOOM

Tadaomi Komatsu, Akashi, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan and Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Jul. 10, 1978, Ser. No. 923,638
Int. Cl.[2] B66C *23/06*
U.S. Cl. 212—58 R **6 Claims**



1. A derrick crane comprising: an upright derrick post having a hollow interior; a turning ring rotatably supported to rotate around a lower part of the derrick post about a vertical axis; a derrick boom pivotally supported at the inner proximal end thereof on the turning ring in a manner permitting up-and-down derricking movement of the boom; a swivel pulley rotatably supported at the top of the post to swivel freely about a vertical axis and rotatably supporting a plurality of sheaves; a derricking tackle connected between the swivel pulley and the top end of the boom and including a derricking cable passed around a sheave of the swivel pulley, extended downward therefrom to and around a stationary sheave, and wound around a powered winch; a cargo hoisting tackle connected between the top end of the boom and means for suspending a cargo article therefrom and including a hoisting cable passed around another sheave of the swivel pulley, extended downward therefrom to and around another stationary sheave, and wound around a powered winch; a mechanism for preventing mutual contacting of the derricking and hoisting cables comprising a plurality of vertically spaced-apart intermediate turntables rotatably supported in the hollow interior of the post to

freely rotate about a vertical axis and located between the swivel pulley and the stationary sheaves, said turntable having spaced-apart sheaves for guiding and maintaining apart the derricking and hoisting cables, and means for so intercoupling the swivel pulley and the turntables that each of the differences between the rotational angles of the swivel pulley and the nearest turntable and between adjacent turntables does not exceed a specific angle thereby to prevent mutual contacting and rubbing of the derricking and hoisting cables; and a mechanism for controllably driving the turning ring comprising at least one slewing drum, motive power means for driving said drum in forward and reverse directions, and cables wound around the turning ring and the slewing drum and operating to transmit torque therebetween.

4,187,950

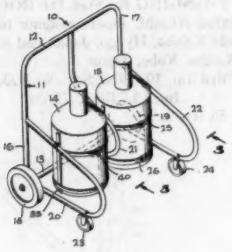
GAS CAN TRANSPORTER

Gale P. Peet, 6960 Yarmouth Ave., Reseda, Calif. 91335

Filed Jun. 27, 1977, Ser. No. 810,428

Int. Cl.[2] B65G *65/24;* **F17C** *13/08;* **B65G** *65/00*

U.S. Cl. 414—421 **1 Claim**



1. A transporter for liquid containers comprising:

a pair of liquid containers;

a wheeled frame having a vertical brace portion and a frontal portion extending outwardly from said brace portion;

said frontal portion having a plurality of bars defining storage areas between adjacent ones of said bars intended to be occupied by a liquid container;

pivot means secured to said frontal bars;

strap means detachably secured to each of said liquid containers for rotatably mounting said liquid containers onto said bars via said pivot means;

said wheeled frame includes a pair of wheels carried on said vertical brace portion and a pair of castered wheels carried on selected ones of said frontal bars;

said strap means includes a pair of vertically disposed straps associated with each container and a pair of removable bands trained about said straps and said associated container;

said pivot means includes laterally projecting pivots carried from each of said vertical straps rotatably engageable with a respective sleeve secured to each of said frontal bars;

at least three frontal bars are provided and wherein the center frontal bar is of shorter length than the adjacent side front bars; and

said pivot means permit said liquid containers to rotate in a fore and aft orientation with respect to said wheeled frame.

4,187,951

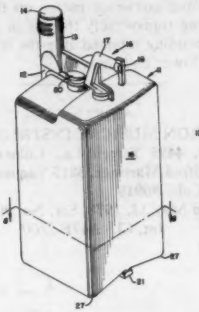
BLOW MOLDED BOTTLE WITH DIFFUSER AND METHOD FOR MAKING SAME

Orlando D. Cambio, Jr., Bristol, Wis., assignor to Respiratory Care, Inc., Arlington Heights, Ill.

Filed May 11, 1978, Ser. No. 904,980

Int. Cl.[2] B65D *01/04;* **B05B** *07/32*

U.S. Cl. 215—6 **5 Claims**



1. A blow molded bottle with diffuser comprising:

(a) an upper chamber for containing a fluid and having a bottom;

(b) a lower portion comprising a manifold;

(c) said lower portion being integrally formed with said chamber and being separated from each other by a relatively narrow band of thermoplastic material having a plurality of small conduits of like configuration therethrough whereby there is communication between the said chamber and the said manifold through said bottom;

(d) said small conduits have an internal diameter smaller over a majority of their length and increasingly larger diameter at said manifold thereby diminishing audible emission of gas therethrough;

(e) second conduit means;

(f) said second conduit means being integrally molded along a side of said chamber;

(g) one end of said conduit means terminating and communicating with the said manifold;

(h) the other end of said second conduit means terminating above said chamber with a breachable sealing means;

(i) said chamber having a neck portion thereabove;

(j) said neck portion terminating in a port means having an integral sealing means.

4,187,952

CANNULA PIERCEABLE, SELF-SEALING CLOSURE

Edward P. Percarpio, North Haledon, N.J., assignor to Becton, Dickinson and Company, Rutherford, N.J.

Division of Ser. No. 880,474, Feb. 23, 1978, Pat. No. 4,136,794, which is a division of Ser. No. 729,643, Oct. 5, 1976, Pat. No. 4,111,326, and a continuation-in-part of Ser. No. 663,921, Mar. 4, 1976, abandoned. This application Sep. 13, 1978, Ser. No. 942,056

Int. Cl.[2] B65D *39/04*

U.S. Cl. 215—247 **2 Claims**

1. A cannula pierceable, self-sealing, gas proof closure for sealing an open end of an air evacuated blood collection tube, which comprises;

(a) a tubular elastomeric body having

(i) flexible, elastic sidewalls;

(ii) an open first end; and

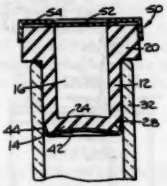
(iii) a closed second end formed by a cannula pierceable, flexible, elastic end wall integral with said sidewalls;

(b) a flange disposed radially about the periphery of said sidewalls adjacent to said first end;

(c) a protective cap adhered to the outside of said closed second end; and

(d) a puncturable diaphragm closing the open first end;

said end wall having a convex inner surface and a concave outer surface when pressure on inner and on outer surfaces is equal, said tubular body having a diameter which bears a ratio to the height of the body of about 0.8:1 and to thickness of the second end of from 5.4:1 to 12.1:1;



whereby when the closure is emplaced in and sealing an open end of an air evacuated tube, the higher pressure on the convex inner surface of the end wall as compared to the lower pressure (vacuum) exerting itself on the concave outer surface creates a pressure differential on the end wall, flexing and flattening the concave-convex configuration and creating a radial force directed toward the periphery of the end wall, said force effecting a restraining and sealing force between the closed second end of the elastomeric body and the air evacuated tube.

4,187,953

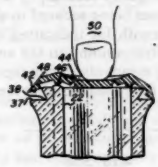
SECURITY CONTAINER AND CLOSURE APPARATUS

Lloyd S. Turner, Los Gatos, Calif., assignor to Basic Products Development Company, Inc., Hayward, Calif.

Filed May 18, 1978, Ser. No. 906,970

Int. Cl.[2] B65D *17/00, 39/00, 43/04*

U.S. Cl. 215—301 **18 Claims**



1. An improved security container and closure apparatus comprising:

container means including

a neck portion having a circumscribing first locking means formed in its outer surface proximate a mouth-forming end thereof,

a circumscribing flange means provided adjacent and beneath said first locking means and having a first outside diameter,

means projecting radially inwardly from a relatively small circumferential segment of said neck portion and forming a bearing surface that extends into said mouth; and

resilient closure means including a top portion having an upper surface and a lower surface, and a circumscribing, downwardly-depending skirt portion having a second locking means formed on an inside surface thereof for matingly engaging said first locking means, said skirt portion having a lower extremity of a second outside diameter equal to or less than said first diameter and lying in a single plane, whereby when said closure means is positioned to lockingly close said mouth, said first locking means mates with said second locking means to lock said closure means to said container means, and whereby removal of said closure means from said container means is effected by applying a downward force to a central part of said upper surface sufficient to deform said top portion downwardly such that only the part thereof lying over said bearing surface engages said bearing surface and pivots thereabout to lift a contiguous relatively small circumferential segment of said skirt portion upwardly and out of said single plane such that the resiliency of said skirt portion causes the unlifted portion thereof to cam upwardly over said first locking means as said downward force is relieved.

4,187,954

BEVERAGE CONTAINER LID

Lewis J. Striggow, 450 Demode Rd., Holly, Mich. 48442

Filed Jan. 19, 1979, Ser. No. 4,677

Int. Cl.[2] B65D *41/32*

U.S. Cl. 220—90.4 **5 Claims**

1. A lid for a cylindrical beverage container comprising: a disc-shaped horizontal wall member, means adjacent the circumferential edge of said wall member adapted to detachably secure said wall to said container to close the opening therein, a spout member formed in said wall and extending above the surface of said wall, a covered portion formed in the top of said spout member, said covered portion having a perimeter defined by a line of weakening, said cover portion being removable from said spout member upon separating said cover portion at said line of weakening to form an opening in said spout for drinking through said spout from said container, a tab formed on the top of said cover portion and being deflectable to rupture said line of weakening with fingers or teeth to remove said cover portion from said spout member.

4,187,955

ARMORED PIPE CONNECTED TO A STEEL LINING OF A PRESTRESSED CAST PRESSURE TANK

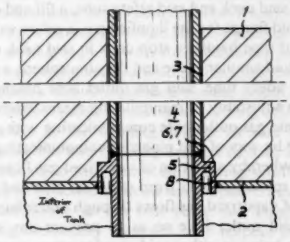
Rolf Dörling, Gummersbach, Fed. Rep. of Germany, assignor to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Filed Mar. 8, 1978, Ser. No. 884,592

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1977, 2710176

Int. Cl.[2] B65D *25/14*

U.S. Cl. 220—435 **2 Claims**



1. A pressure vessel having a cast iron wall fitted with a steel

lining on the inner surface of said wall and having an opening through the wall and lining, said opening in said cast iron wall being enlarged at its inner end to provide an inwardly facing, radial shoulder on said wall, a pipe extending through the opening in said lining and into said wall, a circumferential collar L-shaped in cross section having a cylindrical portion with a free end, said cylindrical portion and free end being spaced from said pipe, the site end of said collar spaced axially and radially from said free end and integrally connected to said pipe, the cylindrical portion of said collar being welded to said lining so that the weld is spaced from the pipe and from said opposite end of said collar to allow expansion of said lining without affecting the diameter of said pipe, said pipe being in engagement with said radial shoulder on said cast iron wall to prevent outward movement of said pipe.

4,187,956

SAFETY INSERT FOR STORAGE VESSELS OF LOW-BOILING LIQUIFIED GASES

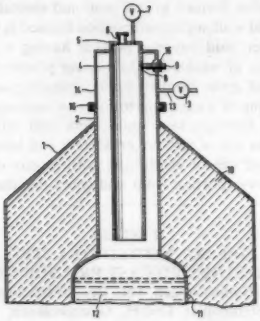
Rolf Schrawer, Bruchkobel; Werner K. Diehl, and Hans M. Ringelstein, both of Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 6, 1978, Ser. No. 949,153

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1977, 2747492

Int. Cl.[2] B65D *25/00*; F17C *13/04*

U.S. Cl. 220—465 **3 Claims**



1. In a safety insert for storage vessels for low boiling, liquified gases wherein the vessel has a neck, a safety tube disposed longitudinally within said neck in flow communication with the contents of the vessel, an annular space being formed between said neck and said safety tube, a flange closing off the outer end of said neck and said safety tube, a fill and extraction opening in said flange for the liquified gas, a safety valve in said flange, a vent pipe having a stop cock in said neck communicating with said annular space and the atmosphere, a gas outlet hole in said safety tube, said gas outlet hole having its flow cross-section adjustably by manipulating means external of said vessel, and said gas outlet hole communicating with said annular space and by way of said pipe also communicating with the atmosphere whereby a portion of vaporized gas flows through said annular space and exits from said vent pipe and a remaining portion of vaporized gas flows through said safety tube and exits from said outlet hole so as to prevent any stationary column from being in either said annular space or said safety tube and thus reducing heat transfer to the liquified gas and minimizing evaporation losses.

4,187,957

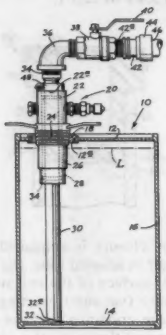
METHOD AND APPARATUS FOR MEASURING LIQUID VOLUME TO BE WITHDRAWN FROM A CONTAINER

Calvin J. Butler, 20189 Cheyenne Rd., Bend, Oreg. 97701

Filed Feb. 13, 1978, Ser. No. 876,893

Int. Cl.[2] B67D *5/08, 5/44*

U.S. Cl. 222—1 **5 Claims**



4. Apparatus for use in predetermining volume of liquid to be withdrawn from a container having top, bottom and side walls comprising:

conduit means insertable through an opening in the top wall selectively shiftable within the container for providing a liquid conducting passage;

external measuring means including a graduated scale which is calibrated over a length substantially equal to the depth of liquid when the container is full positionable adjacent an external portion of said conduit means for displaying liquid volume withdrawable through said conduit means when it is linearly shifted to a preselected position; and,

indicating means releasably secured to said conduit means, said indicating means being secured to said conduit means and shiftable therewith for indicating on said measuring means a length corresponding to the amount of the shifting, said indicating means also being repositionable on said conduit means for fixing said conduit means relative to the container.

4,187,958

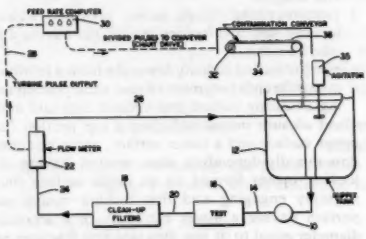
FLOW PROPORTIONAL CONVEYOR DRIVE SYSTEM

Donald A. King, Camarillo, Calif., assignor to Abex Corporation, New York, N.Y.

Filed Sep. 12, 1978, Ser. No. 954,701

Int. Cl.[2] B65G *43/00*

U.S. Cl. 222—57 **1 Claim**



1. An open loop, low speed conveyor drive system comprising a conveyor; a mechanical, wound spring drive for advancing the conveyor, said spring drive including an escapement mechanism which advances the conveyor in discrete incre-

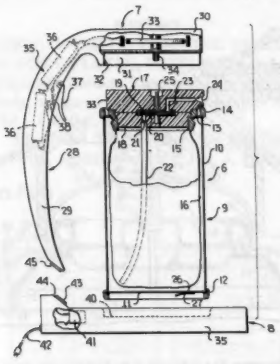
ments; an electrically operated solenoid which operates the escapement mechanism; a fluid conduit; a turbine flow meter in the conduit; a transducer which senses the passage of the turbine blades and generates voltage pulses proportional to the flow of fluid in the conduit; an amplifier which receives the voltage pulses from the transducer and conditions them; a pulse divider which receives the conditioned pulses, the pulse divider having means for dividing the incoming conditioned pulses by a set integer and providing divided output voltage pulses; a second amplifier for conditioning the divided voltage pulses; means conducting the second conditioned voltage pulses to the solenoid, wherein the solenoid is actuated once to operate the escapement mechanism once to advance the conveyor one increment each time the solenoid receives a second conditioned voltage pulse.

4,187,959

PROPELLANTLESS AEROSOL DISPENSING SYSTEM

Peter G. Pelton, St. Louis, Mo., assignor to The Continental Group, Inc., New York, N.Y.

Filed Aug. 17, 1978, Ser. No. 934,568
Int. Cl.[2] B67D *5/40*
U.S. Cl. 222—94 **12 Claims**



1. A propellantless aerosol dispensing assembly comprising a support container including a body and a bottom end, a partial top end in the form of an annular closure element, a product container carried by said annular closure element and disposed within said support container, a dispensing unit closing said support container and said product container, and single sealing means sealing said product container to both said dispensing unit and said closure element, said product container being in the form of a collapsible bag.

4,187,960

DISPENSER WITH CAP AND PROTECTIVE MEMBER

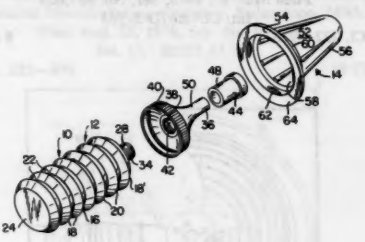
Joseph P. Bonk, Des Plaines, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Jul. 27, 1978, Ser. No. 928,757
Int. Cl.[2] B65D *35/08*
U.S. Cl. 222—107 **3 Claims**

1. A dispenser, comprising:

a receptacle comprising, a container having a plurality of contiguous bellows defining a chamber and an outer annular edge, a hollow nipple extending distally from said container, a cap for releasably closing a distal end of said nipple, and means for releasably attaching a proximal end of said nipple to a distal end of said container; and

a protective member having sidewalls defining a cavity to receive said nipple and cap in a closure position of the protective member with a proximal end portion of the protective member extending peripherally around the container, and means for releasably connecting said proximal end portion of the protective member to said container at a location proximal the attaching means in said closure position and for substantially closing the cavity about the container to prevent leakage from the dispenser,



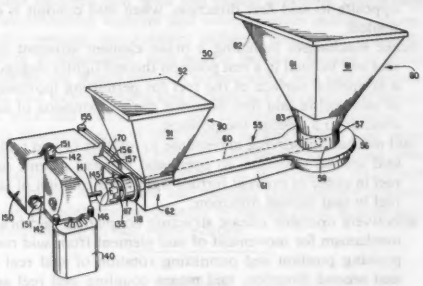
said connecting means comprising a plurality of inwardly directed bosses on said annular member for placement over the outer edge of one of said bellows in said closure position of the protective member.

4,187,961

DYE METERING SYSTEM

Ronald L. Voller, 1265 Franklin La., Buffalo Gove, Ill. 60090

Filed Mar. 20, 1978, Ser. No. 888,332
Int. Cl.[2] B65G *33/14*
U.S. Cl. 222—133 **13 Claims**



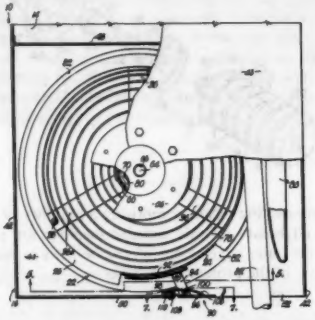
1. A system for introducing a predetermined amount of particulate matter to a continuous flowing stream of material flowing in a first path from a source thereof, said system comprising a hopper having a storage area for storing the particulate matter and having a downwardly extending neck defining an opening in communication with said hopper storage area, a frame member, a sleeve supported by said frame member extending to the first path and having an opening therein complementary in size to the opening defined by said neck and in registry therewith, said opening defined by said hopper neck and said opening in said sleeve cooperating with said hopper and said sleeve to define a closed second path from said hopper through said sleeve to the first path, said hopper and said sleeve being frictionally mounted with respect to each other and to said frame for easy removal and replacement, and means for transporting particulate matter from said hopper along the second path to the first path at a predetermined rate.

4,187,962

FUEL SERVICE TANK WITH SELF-RETRACTING HOSE REEL

Elbert C. Henry, Concordia, Kans., assignor to Henry Enterprises, Inc., Concordia, Kans.

Filed Mar. 17, 1978, Ser. No. 887,653
Int. Cl.[2] B67D *5/365*
U.S. Cl. 222—173 **8 Claims**



1. Liquid-dispensing apparatus, comprising: a tank adapted to hold a liquid to be dispensed; a liquid delivery assembly, including

a rotatable reel;

a length of flexible liquid delivery conduit having an inner liquid-receiving end and an outer liquid-delivery end, said conduit having a retracted position wherein the conduit is wrapped about said reel, there being means operatively coupling said reel and conduit for rotation of the reel in a first direction when the conduit is grasped adjacent said delivery end thereof and pulled from the reel in order to extend the conduit for use thereof;

means for biasing said reel in a second rotational direction opposite to said first direction, when said conduit is extended;

brake mechanism including a brake element adjacent said reel and located in a rest position thereof lightly engaging a peripheral surface of the reel for permitting movement of said reel in said first direction during extension of said conduit to a desired use position,

said mechanism serving in response to rotation of said reel in said second direction, to press said element against said reel in order to prevent further significant rotation of said reel in said second direction;

selectively operable release structure coupled to said brake mechanism for movement of said element from said reel-pressing position and permitting rotation of said reel in said second direction, said means coupling said reel and conduit serving to retract said conduit and rewrap the latter about said reel;

means for coupling said tank and said delivery end of said conduit for flow of said liquid through the latter; and

means for selectively pumping said liquid from said tank and through said conduit for delivery thereof,

said mechanism including an arm swingable relative to said reel about an axis substantially parallel to the axis of rotation of said reel,

said element being attached to an inner end of said arm and said release structure including a rigid actuating member fixedly attached to an outer end of said arm in normally spaced proximity to said conduit,

said arm and said element having a dimension measured radially from said swinging axis of the arm that exceeds the radial distance from said axis of the arm to said surface of the reel, and said arm and said element being disposed with said dimension thereof located behind a center line intersecting said axes with respect to said second direction of rotation of the reel.

said surface tending to swing said element away from the same during said extension of the conduit and rotation of the reel in said first direction and tending to swing the element into progressively tighter engagement with said surface in response to attempted rotation of the reel in said second direction,

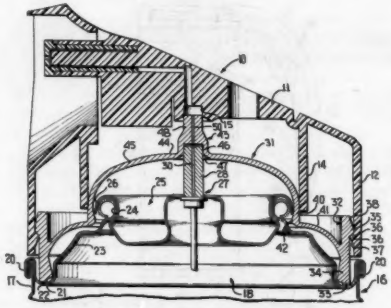
said conduit being selectively shiftable laterally of its longitudinal axis into actuating engagement with said member when the conduit is in an extended, use position for swinging the member, the arm and said element in a direction to swing said element away from said surface, thereby rendering said biasing means operable to rotate said reel in said second direction and retract said conduit.

4,187,963

ADAPTER RING FOR DISPENSING OVERCAP

Carmen T. Mascia, Clarendon Hills, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Sep. 22, 1978, Ser. No. 944,954
Int. Cl.[2] B65D *83/14*
U.S. Cl. 222—402.13 **10 Claims**



1. An adapter ring for adapting a dispensing overcap to a dispensing end unit of an aerosol and the like container having a valve stem, said adapter ring comprising an annular support ring having first means on a lower portion for seating engagement with a dispensing end unit and second means on an upper portion for interlocking engagement with a dispensing overcap, an axially extending valve stem adapter centered relative to said support ring and axially spaced relative thereto for providing a fluid connection between a valve stem and a dispensing cap, and connecting means between said support ring and said valve stem adapter mounting said valve stem adapter on said support ring for limited axial movement relative to said support ring.

4,187,964

COMBINED CLOSURE CAP AND POUR-OUT FITMENT

Burton S. Bogart, Columbus, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Filed Aug. 1, 1978, Ser. No. 929,998
Int. Cl.[2] B65D *41/04, 41/28*
U.S. Cl. 222—546 **14 Claims**

1. In combination a closure cap and pour-out firment:

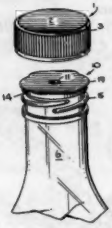
said closure cap including a cover and a depending skirt with container engaging means;

a projecting plug at the center of the underside of said closure cover;

a pour-out fitment having a disc-like membrane with closure cap engaging means at its edge frictionally engaging the inner surface of said closure skirt between the closure cover and the container engaging means;

a pour-out aperture at the center of said membrane for receiving said plug;

means at the outer edge of said membrane for frictionally engaging a container at its rim when the combination is applied to the container; and



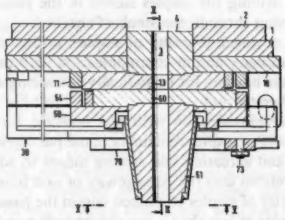
a plurality of sealing ribs near the outer edge of the underside of said closure cover for sealing engagement with the facing surface of said fitment membrane.

4,187,965

BOX DISCHARGER COMPRISING RELOADABLE REFRACTORY PLATES, WITH WEDGE LOCKING

Giovanni Aliprandi; Roberto Ricci, and Giovanni Timossi, all of Genoa, Italy, assignors to SANAC Societa per Azioni Refrattari Argille e Calolini, Italy

Filed Apr. 21, 1978, Ser. No. 898,774
Claims priority, application Italy, Jun. 6, 1977, 12627 A/77
Int. Cl.[2] B22D *37/00*
U.S. Cl. 222—600 **8 Claims**



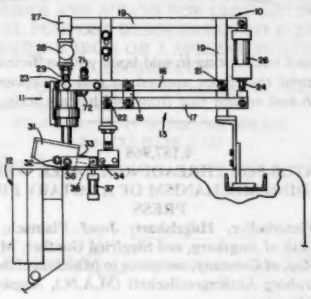
1. A box discharger particularly for ladles and the like, of the type comprising, a first metal stationary upper plate fastened onto the bottom of said ladle or the like; a second metal lower plate connected to said upper plate so as to be tiltable from a work position, wherein said tilting plate parallel to said stationary plate to a maintenance position wherein said tilting plate defines with said stationary plate an angle sufficient to allow access to the inside of said discharger; a third metal plate slidable between the first two plates; wherein said three plates each comprises a bore for the passage of a flow of liquid metal when said discharger is in an open position; flattened refractory bricks fastened against the lower face of said upper stationary plate and the upper face of said sliding plate, said flattened refractory bricks sealingly sliding against each other during the discharger movement, said bricks being provided with holes for the passage of the liquid metal when said holes are in registry; the lower face of said tilting lower plate being mounted turnably, a section of annular crown provided on an outer edge of said tilting lower plate with at least two wedge-shaped wings projecting outwards to engage grooves provided on two uprights projecting from the lower face of said stationary upper plate, laterally to the outer profile of said tilting plate; said two uprights, and and driving means provided for rotating said section of annular crown.

4,187,966

METAL DISPENSING VALVE ASSEMBLY FOR BATTERY GRID CASTING MACHINE

Basil R. Van Linder, Oshtemo Township, Kalamazoo County; Ronald C. Van Linder, Watervliet Township, Berrien County, and Fredrick G. McLane, Portage, all of Mich., assignors to Kalamazoo Manufacturing Company, Kalamazoo, Mich.

Filed Aug. 23, 1978, Ser. No. 936,099
Int. Cl.[2] B22D *41/10*
U.S. Cl. 222—601 **10 Claims**



1. In a battery grid casting machine having a mold, a movable filling ladle for supplying a preselected quantity of molten metal to said mold, a nozzle member connected to a source of molten metal, and valve means for dispensing said preselected quantity of molten metal from said nozzle member into said ladle, said valve means including a housing cooperating with said nozzle member and defining therein a valve member adapted for movement between open and closed positions relative to said nozzle member, said housing defining a discharge passage for supplying molten metal into said ladle, and means for moving said valve member relative to said nozzle member between said open and closed positions, comprising the improvement wherein said valve member includes an upwardly opening cup member defining therein an upwardly opening compartment, said nozzle member having a lower discharge end which projects downwardly into said compartment, said valve member also including a valve portion associated with said cup member and positioned for engaging the lower discharge end of said nozzle member when said valve member is in said closed position, said discharge passage communicating with said compartment at an elevation above said valve portion so that said cup member continuously contains therein a predetermined quantity of molten metal in surrounding relationship to said valve portion.

4,187,967

SWIVEL HOOK ATTACHMENT FOR ARTICLE HANGERS

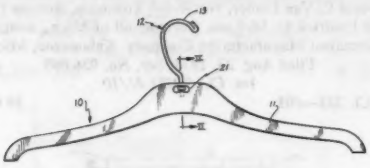
Judd F. Garrison, Grand Rapids, Mich., assignor to John Thomas Batts, Inc., Zeeland, Mich.

Filed Jun. 8, 1978, Ser. No. 913,841
Int. Cl.[2] A47J *51/098*
U.S. Cl. 223—92 **22 Claims**

1. A molded plastic hanger, said hanger having a molded body, said body having a hook-receiving opening extending vertically into said hanger from the top thereof and means for securing a hook thereto, said means comprising:

an aperture formed in said hanger body aligned with said hook-receiving opening and spaced from the top of said hanger to form a bridge integral with said body between the top of said aperture and the top of said hanger body; said aperture spaced from the bottom of said body to form a second bridge-like portion forming the bottom wall of said aperture; an anchor ring in said opening detachably

secured to said hanger body; said anchor ring having an opening therein to receive said hook; said opening being of a size to provide an interference fit with said hook to



bind said anchor ring to said hook with sufficient interengagement that force applied to said hook can forcibly detach said anchor ring from said hanger body.

4,187,968

APPARATUS FOR THREADING A PAPER WEB INTO THE FOLDING MECHANISM OF A ROTARY PRINTING PRESS

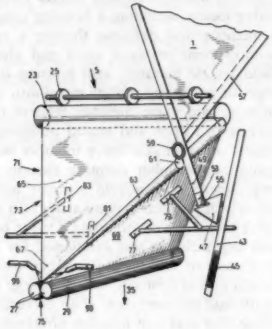
Johann Winterholler, Hugelshart; Josef Plantsch; Herbert Stockl, both of Augsburg, and Siegfried Gunther, Munich, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft (M.A.N.), Augsburg, Fed. Rep. of Germany

Filed Dec. 19, 1977, Ser. No. 861,966

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1976, 2657789

Int. Cl.[2] B65H *23/32*

U.S. Cl. 226—92 **11 Claims**



1. Apparatus to thread a paper web into the folding mechanism of a rotary printing press having

a folding former (**5,65**);

driven supply rollers (**23,25**) upstream of the folding former to supply a web of paper (**1**) thereto;

two take up rollers (**27**) downstream of the folding former and having their axes located at right angles to the supply rollers (**23,25**), and forming a nip (**75**) there between;

and comprising, in accordance with the invention

two paper guide baffles (**69,71**) located at the back side of the folding former (**5,65**) extending in converging direction from the edges of the former to the tip (**67**) of the former and up to the nip (**75**) between the take-up rollers (**27**);

air pressure differential generating means (**77,79, 81,83**) generating an under pressure adjacent to the surfaces of the guide baffles (**69,71**) of sufficient intensity to pull the paper web (**1**) over the edges (**63,73**) of the former and into the nip (**75**) between the take-up rollers (**27**);

and means (**29,99**) acting on the take-up rollers providing rotational force thereto to provide for driving force by said take-up roller on the paper web (**1**) introduced in the nip between said rollers upon threading of the web over the former.

4,187,969

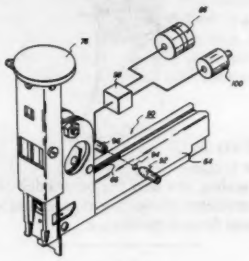
FIXED STAPLER HEAD

Charles W. Spehrley, Jr., Quechee, Vt., assignor to Xerox Corporation, Stamford, Conn.

Filed May 15, 1978, Ser. No. 905,665

Int. Cl.[2] B27F *7/06*

U.S. Cl. 227—2 **6 Claims**



1. An apparatus for driving a staple through a stack of sheets, including:

a housing having a passageway for storing therein at least one staple, said housing being mounted stationarily and having a clamping surface;

means for moving the stack of sheets into contact with the clamping surface of said housing to hold the stack of sheets securely during the stapling operation;

means for driving the staples stored in the passageway of said housing through the stack of sheets;

means for storing a plurality of staples, said storing means being stationary and in communication with the passageway in said housing for periodically advancing a supply of staples thereto; and

means, in communication with said housing, for detecting the quantity of staples remaining in the passageway of said housing and actuating said storing means to advance staples therefrom into the passageway of said housing when the quantity of staples contained within the passageway of said housing is less than a pre-determined number.

4,187,970

APPARATUS FOR ATTACHING TAG PIN

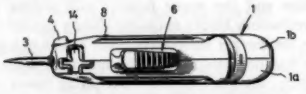
Akira Furutu, Tokyo, Japan, assignor to Japan Bano'k Co., Ltd., Japan

Continuation of Ser. No. 836,706, Sep. 26, 1977, abandoned, which is a continuation of Ser. No. 699,572, Jun. 24, 1976, Pat. No. 4,090,653. This application May 9, 1978, Ser. No. 904,297

The portion of the term of this patent subsequent to May 23, 1995, has been disclaimed.

Int. Cl.[2] B65C *5/06*

U.S. Cl. 227—8 **8 Claims**



1. An apparatus for attaching a tag-pin comprising:

a pistol-shaped body;

a lever supported on said body for rocking movement;

a rod driven by means of said lever;

a ratchet wheel mounted near a slot for inserting tag pins;

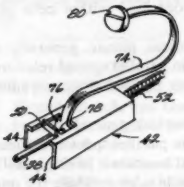
a ratchet for preventing the inverse rotation of the ratchet wheel and adaptable for disengagement therewith:
a feeding knob for driving said ratchet wheel;
a grooved needle provided at one end of said pistol-shaped body, said rod being located for movement on the axis of said needle;
a piston supporting said rod;
a trigger-like lever means directly driving said piston;
a free lever provided in relation to said ratchet for preventing inverse rotation of the ratchet wheel, said free lever being operated from the side of said body to produce disengagement of the ratchet from said ratchet wheel; and
an adjusting means removably attached at the forward portion of said pistol-shaped body to adjust the length of insertion of said grooved needle into an article.

4,187,971

STAPLER FOR AN IMPROVED FLEXIBLE PUSHER RETRACTING MEMBER

Raymond A. Prew, Jr., Foster, R.I., assignor to Textron Inc., Providence, R.I.

Filed Jun. 29, 1978, Ser. No. 920,195
Int. Cl.[2] B25C *5/16*
U.S. Cl. 227—125 **9 Claims**



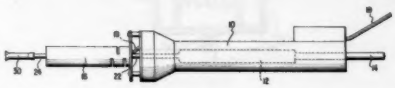
1. In a staple driving device comprising
a magazine structure having means defining a drive track and means defining an elongated open top chamber leading to said drive track of a size to receive and support a staple stick therein,
a staple stick pusher disposed within said chamber,
means mounting said pusher within said chamber for generally rectilinear movement toward and away from said drive track, said mounting means including an elongated rod fixedly mounted in said magazine structure, said pusher having a sliding connection with said rod,
spring means resiliently biasing said pusher in a direction toward said drive track,
a top cover member mounted for pivotal movement between an operative position disposed in closing relation with the open top of said magazine chamber and a staple stick loading position displaced from said magazine chamber an arcuate extent sufficient to expose the open top thereof for convenient loading of a staple stick therein,
a lever member having a staple driving element,
means mounting said lever member for pivotal movement through (A) staple driving cycles each of which includes (1) a drive stroke during which a staple in said drive track is driven by said staple driving element from said drive track and (2) a return stroke, and (B) staple stick loading cycles each of which includes (1) a magazine opening stroke during which said cover member is moved with said lever member from the operative position thereof to the staple stick loading position thereof and (2) a magazine closing stroke during which said cover member is moved with said lever member from the staple stick loading position thereof to the operative position thereof,
and elongated flexible pusher retracting means operatively connected with said pusher and said cover member for (A) effecting movement of said pusher in a direction away from said drive track into a stick loading position in response to the movement of said cover member with said lever member through said magazine opening stroke and (B) permitting said pusher member to be moved by the resilient bias of said spring means toward said drive track when said cover member is in said operative position,
the improvement in combination therewith which comprises said pusher retracting means having one end portion thereof abuttingly engaging said pusher and formed with an aperture through which said rod extends.

4,187,972

APPARATUS INCLUDING GENERAL PURPOSE DESOLDERER AND MEANS FOR CONVERTING THE GENERAL PURPOSE DESOLDERER TO EITHER A SOLDERING IRON OR A SPECIAL PURPOSE DESOLDERER

Alexander J. Vella, Bethesda, Md., assignor to Pace Incorporated, Silver Spring, Md.

Filed Mar. 28, 1978, Ser. No. 891,041
Int. Cl.[2] B23K *3/02*
U.S. Cl. 228—20 **31 Claims**



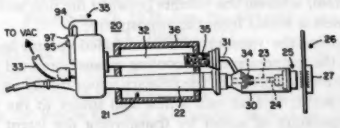
1. Apparatus including a general purpose desolderer and converting means for converting the general purpose desolderer to either a soldering iron or a special purpose desolderer, said apparatus comprising
a handle;
solder collection means disposed within said handle and being adapted for connection to a vacuum source;
heating means connected to said handle, said means having an opening extending therethrough in communication with said solder collection means;
a desoldering tip in thermal contact with said heating means and having an opening extending therethrough in communication with the opening in said heating means so that when said device is employed as said desolderer, molten solder or the like may be sucked through said tip and said heater assembly into said solder collection chamber, said handle, solder collection means, heating means and desoldering tip comprising said general purpose desolderer; and
said converting means including a further tip removably mounted on said desoldering tip and in heat contact therewith so that heat flows from the desoldering tip to the further tip whereby said general purpose desolderer may be converted to either said soldering iron or said special purpose desolderer depending on the configuration of said further tip.

4,187,973

DESOLDERING SYSTEM FOR USE WITH A SOLDERING INSTRUMENT

William S. Fortune, 14250 Dearborn Street, Panorama City, Calif. 91402

Filed Feb. 6, 1978, Ser. No. 875,569
Int. Cl.[2] B23K *3/00*
U.S. Cl. 228—20 **6 Claims**



1. A desoldering attachment for a soldering instrument of

the type having a heater sleeve with a heater element disposed therein and an outer, externally threaded end portion, said desoldering attachment comprising:

(a) a desoldering sleeve surrounding the heater element and heater sleeve;

(b) a desoldering tip having internal threads to mate with the external threads of the heater sleeve, said desoldering tip having at least one solder suction aperture extending therethrough, said desoldering sleeve having an internal surface to provide a reservoir for the sucked in solder at a level below that of the termination of said aperture;

(c) a desoldering filter barrel having a suction correction to said desoldering sleeve;

(d) a solder trap in said desoldering sleeve at said suction connection; and

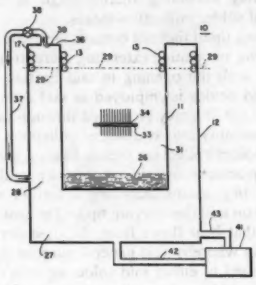
(e) a three-way valve connected to said desoldering barrel for connecting at will a source of vacuum to said barrel or for connecting said valve to the ambient atmosphere, or for closing the air access opening of said valve.

4,187,974

CONDENSATION SOLDERING FACILITY

Roop L. Mahajan, Lawrenceville, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Mar. 13, 1978, Ser. No. 885,930
Int. Cl.[2] B23K *3/00*
U.S. Cl. 228—242 **9 Claims**



1. A method of soldering an article having previously applied solder thereon, comprising the steps of:

condensing a portion of a first vapor on a first vessel, having a primary heat transfer liquid therein, to transfer the latent heat of vaporization of the first vapor to the vessel to boil the heat transfer liquid therein and generate a primary vapor therefrom;

generating the first vapor, having a temperature greater than the melting temperature of the solder, in a second vessel, having at least a portion of the first vessel mounted therein, wherein the volume between the first and second vessels is sealed from the atmosphere;

controlling the pressure within the sealed volume by adjusting the temperature of a cooling means, mounted therein;

condensing a portion of the primary vapor on the article and the solder to heat said article and solder to the melting temperature of solder by transferring the latent heat of vaporization thereto to melt the solder on the article; and

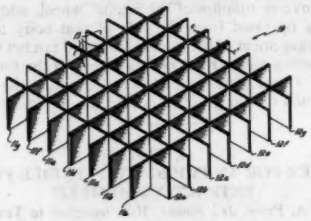
removing the article from the primary vapor to solidify the solder.

4,187,975

COMBINATION SLOTTED PARTITION SPACER

Charles J. Shepherd, Holland, Mich., assignor to W. J. Bradford Paper Company, Holland City, Mich.

Filed Jun. 21, 1978, Ser. No. 917,525
Int. Cl.[2] B65D *1/36, 5/48, 81/00*
U.S. Cl. 229—15 **3 Claims**



1. A multi-cell spacer for maintaining the spacing and separation of articles contained within cells of the spacer, said spacer comprising

a first set of identical, planar, generally rectangular partitions arranged in parallel spacial relationship, each of said partitions having parallel slots extending inwardly from one side edge,

a second set of identical, generally planar, rectangular partitions arranged in parallel spacial relationship, each of said partitions of said second set having parallel slots extending inward from a side edge opposite the one side edge of the partitions of said first set,

the partitions of said first set being perpendicular to the partitions of said second set when said partitions are assembled with said slots of the partitions of the first set interfitted and colinear with the slots of the partitions of said second set, and

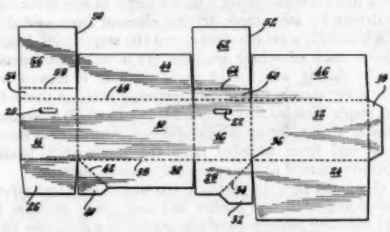
at least one of said partitions being constructed of multiple ply corrugated board and the remainder of said partitions being constructed of non-corrugated fiberboard, said corrugated partition being located at a preselected site within the assembled spacer such that it increases the vertical strength and crush resistance of the resulting combination fiberboard and corrugated board spacer.

4,187,976

COLLAPSIBLE CONTAINER WITH REINFORCING MEMBERS

George A. Mather, Foxboro, Mass., assignor to Champion International Corporation, Stamford, Conn.

Filed Aug. 28, 1978, Ser. No. 937,208
Int. Cl.[2] B65D *5/36, 5/44*
U.S. Cl. 229—41 B **10 Claims**



1. A collapsible container comprising:

first and second generally rectangular side walls;

first and second generally rectangular end walls connecting said side walls to form a rectangular tube; and

a bottom wall assembly including -

(1) a generally rectangular bottom panel joined along a lower edge of one of said side walls,

(2) a first bottom flap joined along a lower edge of one of said end walls and including a single foldable segment integral therewith on one extremity thereof defined by a fold line in said first bottom flap extending diagonally outward from said one end wall,

(3) a second bottom flap joined along a lower edge of the side wall opposite said one side wall, portions of one extremity of said second bottom flap being sandwiched between said bottom panel and said first bottom flap, the opposite extremity of said second bottom flap including a single foldable segment integral therewith and defined by a fold line in said second bottom flap, said last mentioned fold line extending diagonally outward from said opposite side wall,

(4) a third bottom flap joined along a lower edge of the end wall opposite said one end wall and including portions thereof sandwiched between said bottom panel and said second bottom flap,

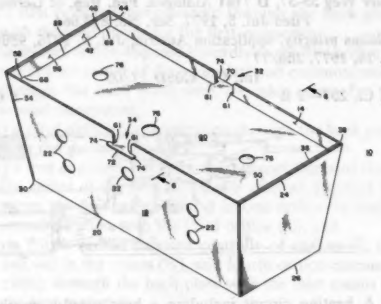
said first and second bottom flaps being respectively foldable into overlapping relationship with said one side wall and said opposite side wall when said container is in a collapsed condition.

4,187,977

TWO PIECE PRODUCE BOX

Richard A. Boykin, Virginia Beach, and Gordon A. Hamilton, Highland Springs, both of Va., assignors to Champion International Corporation, Stamford, Conn.

Filed Jul. 3, 1978, Ser. No. 921,747
Int. Cl.[2] B65D *5/64, 43/04*
U.S. Cl. 229—43 **5 Claims**



1. A two piece produce box comprising:

a base tray having a generally rectangular bottom panel and upstanding end walls and side walls, said end walls and said side walls being trapezoidal in shape with the narrow end of each trapezoidal wall being at the bottom of said base tray such that the perimeter of the top of said tray is larger than the perimeter of the bottom thereof, each said end wall having a pair of spaced slots therein adjacent the top edge thereof while each side wall includes a central recess in the top edge thereof and

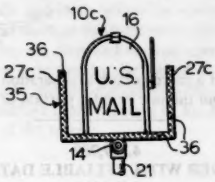
a generally rectangular lid of smaller width than the width of the base tray at the top thereof, said lid having two spaced extension fingers projecting from each end thereof for insertion into a corresponding pair of slots in each end wall of said base tray, said rectangular lid further including a central T-shaped projection extending horizontally from each side thereof for engagement with a corresponding one of said recesses in each side wall of said base tray whereby when said lid is removably locked in place in said base tray, with said T-shaped projections engaged in said recesses, the sides of the base tray apply pressure against the top of said T-shaped projections to hold said projections and the lid in place, and said T-shaped projections also function to support the intermediate span of the lid against collapse.

4,187,978

MAILBOX PROTECTIVE APPARATUS

Raymond A. Dowker, Rte. 3, Box 369, Charlotte, Mich. 48813

Filed May 19, 1978, Ser. No. 907,755
Int. Cl.[2] B65D *91/00*
U.S. Cl. 232—39 **5 Claims**



1. In a mailbox assembly having a vertically disposed support column, an arm cantilevered from the upper portion of said column, and a mailbox mounted upon the outer end portion of said arm, apparatus for protecting said assembly from collisional impacts by objects such as snow plows and propelled snow, comprising

means for hingedly securing said arm for lateral swinging movement about said column;

a shear pin for releasably locking said hinge and associated arm and mailbox against swinging movement;

said pin being shearable in response to a predetermined torsional stress about the axis of said hinge under the collisional impact of said objects to thereby release the hinge and box from locked position;

spring means for damping the initial impact of said collisional objects;

said spring means comprising a pair of upwardly extending plate shields respectively disposed on opposite sides and in spaced relation to said box;

means for fixedly anchoring the lower marginal portions of said plates to said arm whereby said collisional impact will deflect the shields inwardly toward the box, and

struts extending laterally of said box and connecting the upper marginal edges of said shields whereby a part of the impact upon one of the shields will be transmitted to the other.

4,187,979

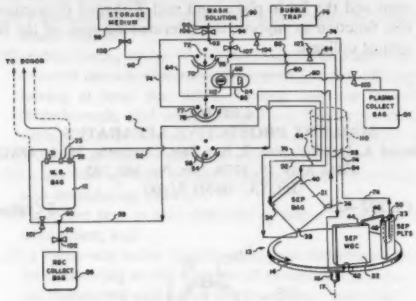
METHOD AND SYSTEM FOR FRACTIONATING A QUANTITY OF BLOOD INTO THE COMPONENTS THEREOF

Herbert M. Cullis, Silver Spring, Md.; Evelyn E. Dorsey, Washington, D.C., and James H. De Vries, McHenry, Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Sep. 21, 1978, Ser. No. 944,640
Int. Cl.[2] B04B *15/12*
U.S. Cl. 233—14 R **86 Claims**

1. A method for fractionating a given amount of whole blood into several of its components, including the steps of: separating the whole blood in a chamber, such as by centrifugation, into at least one cellular portion and a primarily fluid portion; withdrawing the primarily fluid portion from the chamber; passing the primarily fluid portion back through the

one separated cellular portion in the chamber at least once; and then removing the primarily fluid portion from the chamber



thereby to effect a more complete separation of the primarily fluid portion from the one cellular portion of the blood.

4,187,980

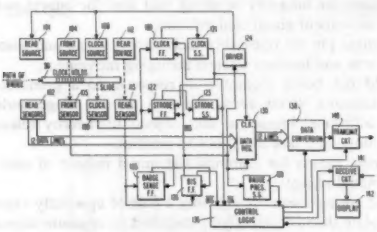
BADGE READER WITH RELIABLE DATA CLOCKING MEANS

John C. Schisselbauer, Southampton; John S. Garczynski; Richard J. Auchinleck, both of Norristown, and Henry J. LoFurno, Philadelphia, all of Pa., assignors to Peripheral Dynamics, Inc., Norristown, Pa.

Filed Jun. 29, 1978, Ser. No. 920,283

Int. Cl.[2] G06K *7/016*

U.S. Cl. 235—474 **11 Claims**



1. Apparatus for reading a data encoded badge, comprising:

a channel for receiving said badge within said apparatus, said channel permitting said badge to move within it;

a slide having clock holes, adapted to move within said channel and normally located in a normal position and moveable;

means for maintaining said badge and said slide in abutting relation while said badge is being moved in a given direction within said apparatus;

means for reading data from said badge while said badge is moved in said given direction, said reading means incorporating means for synchronizing said data reading with the movement of said clock holes.

4,187,981

CODED MODULE FOR USE IN A MAGNETIC PULSE GENERATOR AND METHOD OF MANUFACTURE

Michael J. Sinko, Guilford, Conn., and Milton Velinsky, Atlantic Highlands, N.J., assignors to The Echlin Manufacturing Company, Branford, Conn.

Filed Nov. 30, 1978, Ser. No. 965,023

Int. Cl.[2] G06K *19/04, 7/08;* **G11C** *11/02*

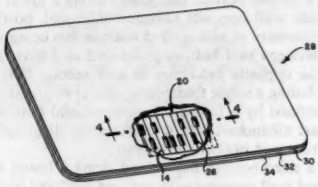
U.S. Cl. 235—488 **9 Claims**

1. A module for use in a coded magnetically induced pulse generator comprising:

a support sheet, and

a set of bi-stable magnetic wires disposed in generally parallel and spaced apart relationship to one another, said wires being supported on said sheet, each of said wires when magnetized having first and second magnetic states and being switchable between said states in response to an external magnetic field passing through first and second threshold values respectively,

a portion of each of said wires being removed, a first subset



of said wires having said portion removed near a first end thereof thereby providing a first bit in a binary code and a second subset of said wires having said portion removed near a second end thereof thereby providing a second bit in a binary code,

said removed portion of each of said wires being spaced inboard from the end of each associated wire thereby leaving a small segment of said wire outboard of the removed portion to provide a degree of physical integrity for the module.

4,187,982

APPARATUS FOR INCREASING THE TRANSMISSION CAPACITY OF REMOTE HEATING GRIDS

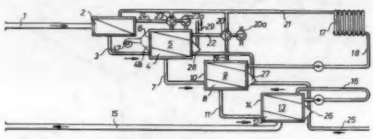
Nikolaus Laing; Ingeborg Laing, and Oliver Laing, all of Hofener Weg 35-37, D 7141 Aldingen, Fed. Rep. of Germany

Filed Jul. 5, 1977, Ser. No. 813,064

Claims priority, application Austria, Jul. 9, 1976, 95061/76; Jan. 14, 1977, 206/77

Int. Cl.[2] G05D *23/00*

U.S. Cl. 237—2 B **6 Claims**



1. A heating circuit including a heat supply circuit of a predetermined transmission capacity adapted to be supplied with a heat carrier supply medium from a remote heating grid, a heat user circuit containing a heat carrier user medium for withdrawing heat from said heat supply circuit including a plurality of heating elements where the transmission capacity of the user circuit is greater than said predetermined transmission capacity of the supply circuit, at least one heat exchanger for exchanging heat between said supply circuit and said user circuit, a first latent heat storage device having a first heat storage mass in heat conducting contact with said one heat exchanger and where said first mass experiences a phase change at a temperature below the temperature of said heat carrier medium coming from the remote heat grid whereby heat supplied by said heat carrier medium may charge said heat storage mass during periods of low withdrawal of heat by said heat user circuit, a second heat exchanger for exchanging heat between said supply circuit and said user circuit and a second latent heat storage device containing a second heat storage mass in heat conducting contact with the second heat exchanger and where the second mass has a lower phase change

temperature than the first mass and whereby said first heat exchanger is positioned upstream of said second heat exchanger with respect to the direction of flow of said heat carrier medium from said remote heating grid.

4,187,983

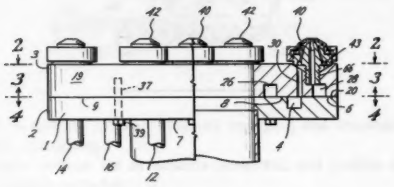
PLURAL COMPONENT-MULTI STATE MIXING AND ENCAPSULATING NOZZLE

Harold Boyer, Houston, Tex., assignor to National Cellulose Corporation, Houston, Tex.

Filed Oct. 17, 1977, Ser. No. 842,433

Int. Cl.² B05B 7/08, 7/14

U.S. Cl. 239—9 **3 Claims**



1. A plural component multi-state mixing and encapsulating nozzle comprising:

(a) a front plate and a back plate each having an inside surface and an outside surface, said inside surface of the front plate in registry with the inside surface of the back plate;

(b) separate inlet means on the outside surface of the back plate for receiving under pressure a first component, a second component, a base material and a gas;

(c) on the inside surface of the back plate:

(i) a first orifice communicating through the back plate with the inlet means for the first component;

(ii) a second orifice disposed inwardly to the first orifice (i) toward the center of the back plate and communicating through the back plate with the inlet means for the second component;

(iii) a third orifice communicating through the back plate with the gas inlet means;

(iv) a first continuous distribution channel disposed about the center of the back plate, said channel disposed between the first orifice (i) and second orifice (ii) and in communication with the third orifice (iii); and

(v) a fourth orifice disposed centrally of orifices (i), (ii), and (iii) in the recess (iv), said fourth orifice communicating through the back plate with the inlet means for the base material;

(d) on the inside surface of the front plate:

(i) a flat outer peripheral surface;

(ii) a second continuous annular distribution channel having an outer perimeter coinciding with the inner perimeter of said flat peripheral surface said channel communicating with the first orifice (c) (i);

(iii) a second surface having an outer perimeter coinciding with the inner perimeter of (d) (ii);

(iv) a third continuous distribution channel having an outer perimeter coindiging with the inner perimeter of (d) (iii) and communicating with the second orifice (c) (ii);

(v) a third surface having an outer perimeter coinciding with the inner perimeter of (d) (iv);

(vi) a centrally disposed orifice bounded by the inner perimeter (d) (v) communicating with and closely conforming to the orifice (c) (v);

(vii) a plurality of orifices disposed within the second surface (d) (iii) and in communication with the first continuous distribution channel (c) (iv);

(e) a means to secure the inside surface of the front plate to the inside surface of the back plate;

(f) on the outside surface of the front plate:

(i) an outer plurality of jet atomizers for atomizing the first component, each jet having a first inlet aperture communicating through the front plate with the channel (d) (ii) and a second inlet aperture communicating through the front plate and one of the orifices (d) (vii) with the channel (c) (iv) on the back plate;

(ii) an inner plurality of jet atomizers for atomizing the second component, each jet having a first inlet aperture communicating through the front plate with the channel (d) (iv) and a second inlet aperture communicating through the front plate and one of the orifices (d) (vii) with the channel (c) (iv) on the back plate; and

(iii) a centrally disposed orifice for communicating the base material through the front plate with the orifice (d) (vi) whereby the first and second components under pressure are atomized by the jets (f) (i) and (f) (ii) respectively and mixed externally of the nozzle and the resulting mixture is also applied to the fibrous material externally of the nozzle.

4,187,984

METALLIZING GUN FOR APPLYING SPRAYED METAL

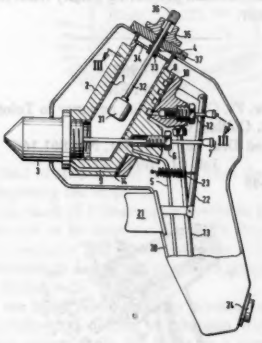
Max Hugelshofer, Dietlikon, Switzerland, assignor to Etablissement Dentaire Ivoclar, Liechtenstein

Filed Apr. 17, 1978, Ser. No. 896,850

Claims priority, application Switzerland, Apr. 22, 1977, 5015/77

Int. Cl.² B05B 1/24

U.S. Cl. 239—13 **10 Claims**



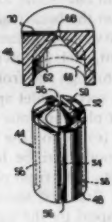
1. An improved metallizing gun for applying sprayed metal which has a melting point below 350° C., which is liquified by an electric heating means provided in the metallizing gun and which is atomized in droplet form by preheated compressed air, wherein the improvement comprises a thinwalled steel container (1) for the liquid metal which is surrounded by a massive block (2) of a thermally conductive metal alloy, which contains an electric heating element (30) narrowly disposed within an elongated recess which recess extends parallel and adjacent to the wall of said steel container and a temperature sensor (5), the external side of said massive block including air ducts (8,11,9) which connect to the spray nozzle (3) and which transmit heat to said block (2).

4,187,985

AEROSOL VALVE FOR BARRIER TYPE PACKAGES

Carl W. Goth, Downers Grove, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Dec. 8, 1978, Ser. No. 967,764
Int. Cl.[2] B05B 7/32
U.S. Cl. 239—337 8 Claims



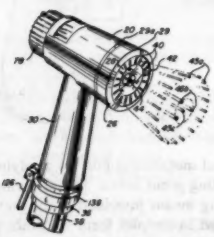
1. A discharge nozzle assembly for use in conjunction with a pressurized liquid product supply, said nozzle assembly comprising a supply tube and a cap, said supply tube and said cap being separately formed, said supply tube comprising a circular cross-sectional elongated member having recessed in one end thereof a spin chamber, said cap being telescoped over said supply tube one end and in conjunction therwith forming a conical extension of said spin chamber, a discharge orifice opening from said spin chamber extension through said cap, said elongated member having formed in the outer surface thereof axial liquid passages of a depth to enter into said spin chamber and a central air inlet passage opening from the atmosphere into said spin chamber extension in alignment with said discharge orifice, said spin chamber and said spin chamber extension in conjunction with pressurized liquid flowing through said liquid passages forming suction means for drawing air into said spin chamber extension for mixing with the liquid, said spin chamber conical extension being in part formed by a cone element projecting axially from the center of said spin chamber.

4,187,986

SPRAYER

John E. Petrovic, Ft. Collins, Colo., assignor to Teledyne Industries, Inc., Ft. Collins, Colo.

Filed Dec. 16, 1977, Ser. No. 861,166
Int. Cl.[2] B05B 1/16
U.S. Cl. 239—449 13 Claims



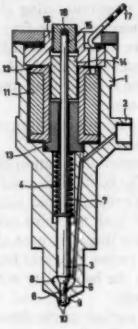
1. In a sprayer that includes:
a hollow housing having an inlet port and an outlet opening,
a cap closing said outlet opening and including a plurality of sets of discharge orifices with each set exhibiting an individually different characteristic of orifice flow of fluid from the interior of said housing, and
means for selectively opening respective orifice sets to the passage of flow out of said housing and for valving the flow of fluid through said housing,
the improvement comprising:
a first set of orifices in said cap circumferentially spaced apart individually and sized to define a fine-spray cone;
a second set of orifices in said cap circumferentially spaced apart individually and sized to define respective jet streams substantially larger than the spray elements from the orifices of said first set; and
another orifice in said cap independent of said first and second sets, including means defining and delivering a different flow characteristic in the form of a mist, said opening means selecting individually as between said first set, said second set and said other orifice.

4,187,987

FUEL INJECTOR

Reimund Raue, Cologne, Fed. Rep. of Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Oct. 30, 1978, Ser. No. 956,095
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1977, 2751358
Int. Cl.[2] F02M 51/06; F16K 31/06
U.S. Cl. 239—585 2 Claims



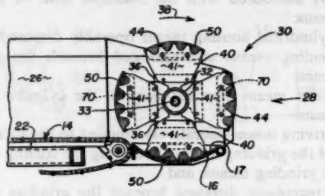
1. A fuel injector for internal combustion engines and comprising a controllable fuel injection pump and a fuel injection valve which includes:
a valve housing containing spray holes;
a valve spring mounted in said valve housing;
a valve needle axially displaceably mounted in said valve housing on one end of said valve spring in such a way as to open against the force of said valve spring in response to build-up of fuel pressure to allow fuel to pass through said spray holes, and in such a way as to close by the force of said spring in response to release of fuel pressure to prevent fuel from passing through said spray holes;
a lifting magnet comprising an armature and a tie bolt and mounted in said valve housing parallel to said valve spring in such a way as to act upon the spring side of said valve needle to work with said valve spring in the closure of said valve needle.

4,187,988

MANURE SPREADER PADDLE ATTACHMENT

Warren H. Brackbill, Paradise, and Loren G. Sadler, Stevens, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Dec. 4, 1978, Ser. No. 966,445
Int. Cl.² A01C *23/00*
U.S. Cl. 239—662 25 Claims



22. A manure spreader material engaging and distributing paddle comprising:

a base portion for detachably mounting said paddle to a manure spreader;

a main body portion integrally formed with said base portion;

an arcuate notched outer peripheral edge portion integrally formed with said main body portion, said notches forming teeth to engage and shred the material to be distributed;

a leading face superimposed over said base portion, said main body portion and said outer peripheral edge portion for striking, engaging and distributing said material;

a trailing face opposed to said leading face; and

a flexible extension attached to said trailing face, said extension having a body defined by a base edge and a remote arcuate peripheral edge substantially parallel to and at least partially coextensive with said notched outer peripheral edge portion, said body being attached to said trailing face adjacent said base edge, whereby said extension provides a structure for engagement of semi-liquid and liquid material while maintaining a capability to deflect when engaging more solidified material, thereby allowing said teeth to engage and shred said material.

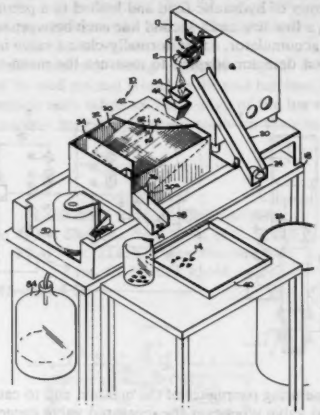
4,187,989

METHOD FOR RECOVERING EMBRYOS FROM EMBRYONATED EGGS

William J. McAleer, Ambler, and William M. Hurni, North Wales, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 742,401, Nov. 16, 1976, abandoned, which is a division of Ser. No. 572,584, Apr. 28, 1975, abandoned. This application Jun. 22, 1978, Ser. No. 917,811
Int. Cl.² B02C *19/18*
U.S. Cl. 241—2 6 Claims

1. A method for recovering an embryo from an embryonated egg comprising the steps of cracking an egg, separating the contents of the egg from the eggshell, moving the eggshell to discharge means, passing the contents of the egg onto a flat screen which is tilted at a compound angle from horizontal whereby one edge is lowermost, the impact with the screen being effective to rupture the membrane tissue surrounding and associated with the embryo, continuously shaking the screen to free the more liquid components of the egg plus the embryo itself from the membrane tissue, thereby causing the embryo to move in a random path gradually toward the lowermost edge of the screen while causing the more fluid portions



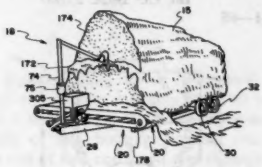
of the contents of the egg to pass through the screen, and collecting the embryo from one edge of the screen.

4,187,990

METERING STACK FEEDER AND METHODS

Ezra C. Lundahl, Providence, Utah, and J. Gordon Wiser, Kirkland, Wash., assignors to Ezra C. Lundahl, Inc, Logan, Utah

Filed Jun. 22, 1978, Ser. No. 917,994
Int. Cl.² B02C *18/06, 21/02*
U.S. Cl. 241—30 18 Claims



1. A method of strip slicing foliage from the end of a stack thereof comprising the steps of:

placing the stack of foliage upon a vehicle and causing one end thereof to be disposed generally above a lateral cut foliage conveyor and generally below a cantilevered cutting mechanism facing the stack and comprising rotatable blade means;

rotating the blade while biaxially pivoting without rotating the cantilevered cutting mechanism from at least one location remote from the blade in a predetermined two dimensional pattern to successively slice side to side arcuate strips of foliage from adjacent sites at the face of the stack thereby shaping said face into a convex surface, which strips are caused to fall upon the lateral conveyor.

4,187,991

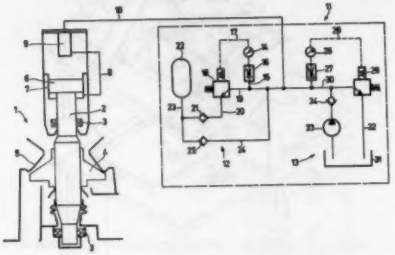
UNLOADING

Denis Petrini Poli, Chatou, France, assignor to Babbitless, Paris, France

Filed Aug. 28, 1978, Ser. No. 937,526
Claims priority, application France, Sep. 8, 1977, 77 27214
Int. Cl.² B02C *2/00*
U.S. Cl. 241—33 9 Claims

1. In a gyratory crusher incorporating a crushing hub fixed

to a shaft, and means adapted to be actuated by hydraulic fluid and thereby hold said shaft in position, an improved automatic unloading device comprising a hydraulic accumulator normally empty of hydraulic fluid and loaded to a predetermined pressure, a first line and a second line each between said means and said accumulator, a first normally-closed valve in said first line, a first detector adapted to measure the mean value of a



critical operating parameter of the crusher, and to cause opening of said valve whenever the measured valve exceeds a first determined limit, said limit being greater than the mean value of said parameter during normal operation of the crusher, and said predetermined pressure being substantially equal to that which exists in said means when said parameter is at said first limit, and a non-return valve in said second line, adapted to open towards said means.

4,187,992

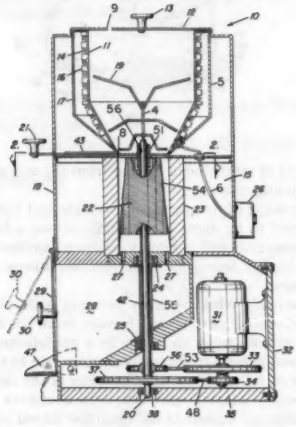
DEVICE FOR RECONSTITUTING USED COFFEE GROUNDS

Leon Del Valle, 10924 Aletta Ave., Culver City, Calif. 90213

Filed May 3, 1978, Ser. No. 902,294

Int. Cl.[2] B02C *23/00*

U.S. Cl. 241—65 **7 Claims**



1. A device for reconstituting used coffee grounds for re-use, comprising:

(a) a cup having a rim thereabout with an opening in the bottom of the cup for receiving the coffee grounds and having an electrical heating element thereabout;

(b) a removable cover cooperatively associated with the rim of the cup having a vent therein for the escape of gases therethrough;

(c) stirring means for moving the coffee grounds within the cup and centrally disposed inside said cup and projecting upwardly therein through the opening in the bottom of the cup via a rotatable shaft;

(d) gate valve means disposed beneath the cup for controlling the flow of the coffee grounds from the bottom of the cup;

(e) frustro-conical grinding means arranged beneath the cup and the valve means for receiving the coffee grounds and for grinding the coffee grounds, said grinding means operably associated with the rotatable shaft of the stirring means;

(f) cylindrical housing means operably disposed about the grinding means and arranged beneath the gate valve means;

(g) sieve means disposed beneath the cylindrical housing means;

(h) driving means operatively coupled to the stirring means and the grinding means for driving the stirring means and the grinding means; and

(i) a receptacle disposed beneath the grinding means for receiving and storing the coffee grounds as the coffee grounds exit from the grinding means.

4,187,993

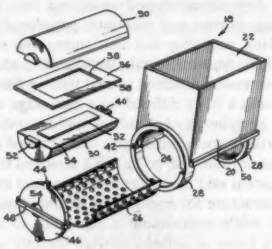
FOOD GRINDER

Esko J. Nopanen, Asheboro, N.C., assignor to General Electric Company, New York, N.Y.

Filed Oct. 10, 1978, Ser. No. 949,955

Int. Cl.[2] B02C *18/26*

U.S. Cl. 241—89.2 **5 Claims**



1. A self-feeding and self-emptying food grinder of a walled hopper with food receiving and bottom discharge openings, the improvement comprising,

a removable foraminated half-circular convex grate enclosing said discharge opening,

a driven cutter and mover assembly transporting food from the hopper,

said assembly including a cylindrical drum of smaller diameter than said grate and rotatably mounted in the bottom discharge opening,

said drum having removable closed end cap means and disposed to contact said grate at only one portion thereof,

a radially slidable blade mounted in said drum to alternately fully extend into the hopper and fully retract into the drum at said contact portion by sliding along the grate,

forming a constantly decreasing volume between the drum and grate on drum rotation to feed food into and squeeze it through said grate to empty the hopper.

4,187,994

YARN WINDING APPARATUS

Thomas B. Lyons, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

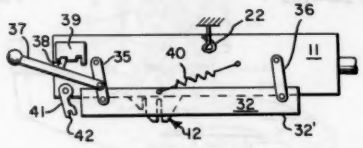
Filed Mar. 16, 1979, Ser. No. 21,569

Int. Cl.[2] B65H *54/20, 54/42*

U.S. Cl. 242—35.5 R **3 Claims**

1. A windup including a source of at least two yarns, a fixed

guide through which said yarns advance in a plane from said source to a traverse guide from which the yarns advance as they are being wound in a reciprocating stroke on respective package supports, said traverse guide comprising: a base, a guide plate embedded in and projecting outwardly from the base, said plate having an outer end generally parallel to said plane and said base and sides converging thereto from the base, said outer end and one of said converging sides being divided into spaced segments by two guide slots, one of said slots



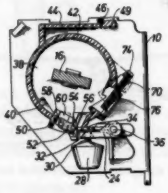
extending to said outer end, the other slot extending through a side of said plate and an elongated guide member positioned adjacent said traverse guide, said guide member having an edge parallel to said plane and extending the length of said stroke, the edge of said guide member being movable from one location exposing one of said slots to another location exposing both of said slots to said yarns, whereby one of said yarns is directed to one of said slots when the guide member is at said one location and the other of said yarns is directed to the other of said slots when the guide member is at the other location.

4,187,995

EMERGENCY LOCKING MECHANISM FOR SEAT BELTS

Gert I. Rex, Halmstad, Sweden, assignor to NYA AB Nyhems Mekaniska Verkstad, Sweden

Filed Oct. 6, 1978, Ser. No. 949,065
Claims priority, application Sweden, Oct. 17, 1977, 7711694
Int. Cl.[2] A62B *35/02*; B65H *75/48*
U.S. Cl. 242—107.4 A **6 Claims**



1. In an emergency locking mechanism for seat belts having a casing adapted to be fixed to a vehicle, a rotatable spindle on said casing for reeling up a seat belt, a toothed ratchet wheel secured to said spindle for rotation therewith, and a locking bar mounted on said casing for tilting movement into and out of a locking position in which one edge thereof projects into a space between adjacent teeth on said wheel to prevent rotation thereof in a belt releasing direction, improved means for tilting said bar into its locking position, comprising

a transfer element surrounding at least a portion of said wheel and operatively connected to said bar,

a synchronizing arm movably mounted on said transfer element and actuatable to connect said element to said ratchet wheel for movement thereby, and

an inertia trigger on said casing for actuating said arm when the change in speed of said vehicle exceeds a predetermined g-value,

said synchronizing arm having spaced projections on opposite ends, respectively, thereof facing the teeth on the rim of said wheel, and being mounted on said element so that upon actuation thereof by said inertia trigger one of said projections is tilted in one direction into engagement with one tooth on said wheel and is forced thereby back in the opposite direction, whereby the tilting movement in said opposite direction causes the projection on the opposite end of said arm to be tilted into the space between a pair of adjacent teeth on said wheel, thereby connecting said transfer element to said wheel, and

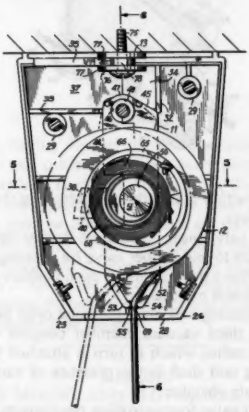
said transfer element being operative upon movement thereof by said ratchet wheel to tilt said bar into its locking position only when said one edge of the bar registers with a space between adjacent teeth on the rim of said wheel.

4,187,996

HANGING PLANT ELEVATOR

Sol Ehrlich, 49 W. 53rd St., New York, N.Y. 10019

Filed Nov. 22, 1978, Ser. No. 962,930
Int. Cl.[2] B65H *75/48*
U.S. Cl. 242—107.4 R **1 Claim**



1. A hanging plant elevating device comprising: a housing element, a spring reel element rotatably mounted within said housing element, a cord carried by said reel element and projecting outwardly of said housing element, and engaging means on a free end of said cord; said reel element having at least one locking lug thereon, said housing element having lug engaging means thereon, which, in engaged condition, prevents rotation of said reel element in a direction in which said cord unwinds from said reel element; an elongated yoke element having a first end portion pivotally mounted within and with respect to said housing element, said reel element being rotatably mounted upon said yoke element at a point in spaced relation relative to said first end portion; said yoke element having a second end portion forming means slidably engaging a continuous segment of cord; whereby lateral movement imparted to said cord serves to pivot said yoke element relative to said housing element to selectively engage said lug engaging means with said locking lug.

4,187,997

VACUUM CONTROL SYSTEM FOR MAGNETIC TAPE HANDLER

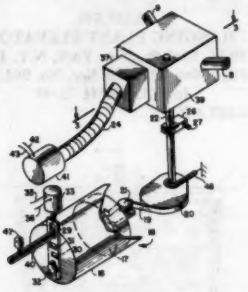
Roger Mosciatti, 6 Wycomb Pl., Coram, N.Y. 11727; Thomas P. Foley, 12 Janes La., Lloyd Harbor, N.Y. 11743, and Frederick G. Moritz, 20 Aberdeen Rd., Hauppauge, N.Y. 11787

Filed Aug. 14, 1978, Ser. No. 933,438
Int. Cl.[2] G11B *15/58, 23/12*
U.S. Cl. 242—182 **3 Claims**

1. In a magnetic tape handler, the combination of;

a pair of servo controlled tape reels for winding magnetic

tape back and forth over a predetermined path between the two reels;
a capstan for drawing said tape across a play/record magnetic head;
a pair of vacuum chambers, one located along the tape path between said capstan and one of said reels and the other located along the tape path between said capstan and the other of said reels;
a vacuum blower for providing a vacuum in said vacuum chambers;
a closed vacuum path between said blower and said chambers;



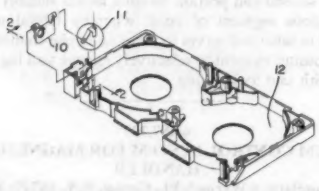
valve means within said path for controlling the vacuum in said chambers;
wherein said valve means includes a flapper valve;
a shaft attached to said flapper valve for rotating said flapper valve between a predetermined open position and a predetermined closed position;
means for adjusting said predetermined open position;
a piston in a third vacuum chamber coupled to a cam of decreasing radius which in turn is attached to said shaft for rotating said shaft in the presence of vacuum in said third vacuum chamber;
and a solenoid valve for controlling the vacuum in said third vacuum chamber.

4,187,998

TAPE CASSETTE

Masatoshi Okamura, and Haruo Shiba, both of Tokyo, Japan, assignors to TDK Electronics Company, Limited, Tokyo, Japan

Filed Jul. 31, 1978, Ser. No. 929,503
Claims priority, application Japan, Nov. 24, 1977, 52-157730[U]
Int. Cl.[2] G03B *1/04*; G11B *23/06*
U.S. Cl. 242—199 **4 Claims**



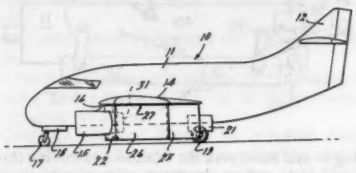
1. A tape cassette comprising:
a half case for housing a tape;
a rib mounted on the half case;
a lock plate;
means for attaching the lock plate to a cover for the half case;
a plate spring fixed to the rib and having one end engagable with the lock plate when the half case is closed by the cover.

4,187,999

VERTICAL ASCENDING AND DESCENDING AIRPLANE

John O. Black, 9607 Sturgeon Valley Rd., Vanderbilt, Mich. 49795

Filed Apr. 28, 1978, Ser. No. 901,209
Int. Cl.[2] B60V *3/08*
U.S. Cl. 244—12.5 **4 Claims**



1. In an airplane construction containing a fuselage and a pair of wings which aids in vertical ascent and descent and horizontal flight, a turbo-jet propulsion means beneath each said wing mounted for horizontal propulsion, and panels hinged to the underside of each said wing to form substantially rectangular areas at the discharge end of the engine, the panels are dimensioned to extend downwardly from said underside of each wing to substantially the level of the ground on which said airplane rests for confining the exhaust gases therefrom within said areas to provide pressurized confined cushions which engage the ground.

4,188,000

AIR RESCUE NET

David G. Dalziel, 83 E. Laurel Ave., Lake Forest, Ill. 60045

Continuation-in-part of Ser. No. 819,411, Jul. 26, 1977, abandoned. This application Jul. 20, 1978, Ser. No. 926,376
Int. Cl.[2] B64D *9/00*
U.S. Cl. 244—137 P **6 Claims**

1. An air rescue device for use with a slowly moving aircraft comprising support means secured to the underside of an aircraft, a shaft, said shaft rotatably journalled to said support means, a pair of rigid longitudinal arms being secured to and extending from said shaft, a net pivotably supported at the end of said arms, drive means for raising said arms and net from a downward vertical position to a horizontal position, said drive means being coupled to said shaft, means for counterbalancing the weight of said arms and said net.

4,188,001

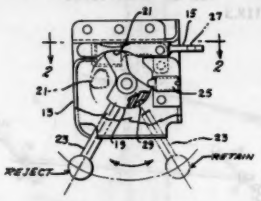
LATCH MECHANISM

Anthony Greger, Rancho Palos Verdes, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 31, 1978, Ser. No. 929,614
Int. Cl.[2] B64D *17/38*
U.S. Cl. 244—151 B **2 Claims**

1. A latch mechanism for use on an aircraft ejection seat and

the like to permit the optional rejection and retention of an attached package, comprising, a housing, a bolt slidably positioned in said housing, said bolt having a cam surface on the side thereof, a pair of detent springs in contact with said bolt for retaining said bolt in position in said housing, a two-position toggle pivotably mounted in said housing for rotation in



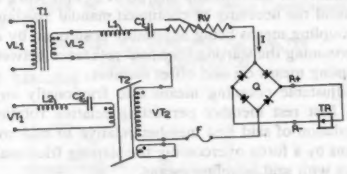
the central area thereof, a cam surface on said toggle for engaging the cam surface on said bolt when said latch is in the rejection mode, and a lever extending radially outward from said toggle to permit selective rotation of the toggle to disengage the cam from said bolt placing said latch in the retention mode and allowing said bolt to slide out of said housing thereby causing the attached package to eject with the ejection seat.

4,188,002

VITAL POWER VARISTOR CIRCUIT FOR RAILROAD SIGNALING SYSTEMS

Heinz Gilcher, Export, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Oct. 23, 1978, Ser. No. 953,527
Int. Cl.² B61L *21/06*
U.S. Cl. 246—34 R **11 Claims**



1. A vital frequency selective varistor circuit arrangement for registering the presence or absence of at least one of two received signals, comprising in combination,

(a) a first input means coupled for receiving a first input signal from a first source supplying an alternating current of a preselected frequency,

(b) a second input means coupled for receiving a second input signal from a second source supplying an alternating current signal normally of said preselected frequency and having a variable phase relationship with said first source,

(c) a varistor device,

(d) a registry means normally occupying a first position and operable to a second position, and

(e) a circuit network tuned to said preselected frequency and coupling said first and second input means, said varistor, and said registry means in series for operating said registry means to its second position to register the simultaneous input of both signals only when of said preselected frequency and within a predetermined phase relationship.

4,188,003

STRAIN RELIEF BUSHING

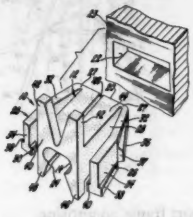
Charles W. Ramsey, Niles, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 20, 1978, Ser. No. 887,950
Int. Cl.² F16L *5/00*
U.S. Cl. 248—56 **2 Claims**

1. A one-piece molded plastic strain relief bushing of the type for mounting within a panel hole an electrical conductor or the like contained within the bushing, comprising:

a body portion having a longitudinal passage extending therethrough, and a transverse opening of reduced width and in communication with the longitudinal passage for sideways reception of an electrical conductor therein,

a pair of longitudinal levers connected to opposite sides of one end of the body portion and each formed to extend toward the other end thereof normally in spaced apart relation with said opposite sides, said levers being movable toward and away from said opposite sides of the body portion about said one end of the latter,



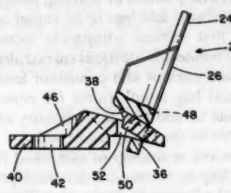
said levers having formed thereon abutment means juxtaposed to said other end of said body portion and means which, with an electrical conductor or the like loosely in place in the bushing, are operative upon insertion of the bushing and the conductor into a panel hole to cause movement of said levers toward said opposite sides, to thereby cause said abutment means to engage said opposite sides of said body portion and compress the latter for tight gripping thereby of the electrical conductor disposed in said longitudinal passage.

4,188,004

CABLE TIE MOUNT AND TIE FOR USE THEREWITH

Ronald T. Fulton, Tinley Park, and Roy A. Moody, Flossmoor, both of Ill., assignors to Panduit Corp., Tinley Park, Ill.

Filed Oct. 12, 1978, Ser. No. 950,768
Int. Cl.² F16L *3/08*
U.S. Cl. 248—74 PB **12 Claims**



1. A mount for securing objects formed into a bundle by a cable tie to a support surface, said tie including a strap extending from a locking head which receives the free end of the strap and further including a frame extending from the locking head opposite the bundle and defining an opening, said mount comprising

a base adapted to be secured to said support surface;

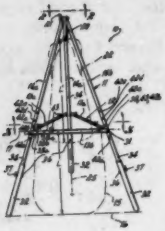
a tongue extending from said base for reception into said opening; and

means for locking said tongue in said opening whereby said cable tie can be locked to said mount and the mount secured to said support surface prior to association of the tie and the objects and whereby no part of said mount is encircled by said strap.

4,188,005
BAG SUPPORT FRAME

Chun C. Lee, 10285 Gentlewind Dr., Cincinnati, Ohio 45242

Filed Dec. 20, 1978, Ser. No. 963,528
Int. Cl.[2] A63B *55/04;* F16M *11/00*
U.S. Cl. 248—97 2 Claims



1. A bag support frame comprising

a plurality of legs connected one to another at the top ends thereof, said legs being connected together one to another for permitting said bag support frame to be moved between use and storage positions,

a bag mouth frame connected with said legs, said bag mouth frame being adapted to support an open mouth primary bag in connected relation therewith, and said bag mouth frame comprising a plurality of rods each of which is connected between adjacent legs of said stand,

horizontal adjustment means connected with said bag mouth frame, said horizontal adjustment means permitting the mouth size of said bag frame to be varied as desired by the user depending on the mouth size of that primary bag being used with said bag support frame, and said horizontal adjustment means comprising connector means by which said rods can be connected at a plurality of locations to at least one of said legs for permitting the bag mouth frame's mouth size to be varied,

first vertical adjustment means connected with said bag mouth frame, said first vertical adjustment means permitting the vertical position of said bag mouth frame relative to the top ends of said legs to be varied as desired by the user, said first vertical adjustment means comprising a plurality of connector locations spaced along the length of each leg with each of said connector locations cooperating with said bag mouth frame for connecting said bag mouth frame to said legs at a plurality of different positions relative to the top of said stand,

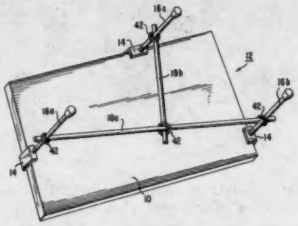
a hook connected at the top of said stand for supporting a secondary bag to be emptied into said primary bag, said first vertical adjustment means permitting the position of said bag mouth frame to be varied relative to said hook depending on the length of said secondary bag to be hung from said hook, and

second vertical adjustment means connected with said legs, said second vertical adjustment means permitting said bag mouth frame to be adjusted vertically relative to ground as desired by by user, said second vertical adjustment means being structured so that adjustment of said bag mouth frame relative to ground is independent of adjustment of said bag mouth frame relative to the top of said stand, and said second vertical adjustment means comprising two sections for each leg with one section being telescopable relative to the other and with said sections being retainable in at least two different length telescoped positions relative one to another.

4,188,006
STEADYING REST TO AID IN STEADYING AN ARTIST'S HAND

Robert Karlin, 38106 Village #38, Leisure Village, Camarillo, Calif. 93010

Filed Feb. 6, 1978, Ser. No. 875,228
Int. Cl.[2] B43L *15/00*
U.S. Cl. 248—118.3 7 Claims



1. An apparatus for providing a steadying rest adjacent a work surface having at least two dimensions comprising:

at least one offset member;

attaching means for temporarily coupling said offset member to a selected position adjacent said work surface;

a first rest member;

adjustable coupling means for coupling said first rest member to said offset member and providing said steadying rest;

said coupling means frictionally engaging said offset member whereby said first rest member can be adjustably positioned by movement of said coupling means in the proximity of substantially any point of said work surface without the necessity of continued manual assistance;

said coupling means being adjustably positioned by a force overcoming the starting frictional resistance between said coupling means on said offset member;

said adjustable coupling means also frictionally engaging said first rest member permitting relative rotation and translation of said first member relative to said coupling means by a force overcoming the starting frictional resistance with said coupling means.

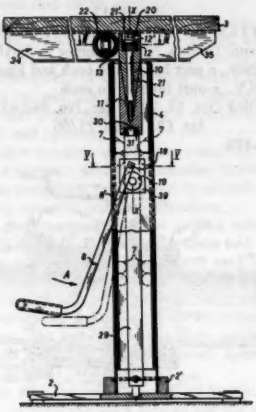
4,188,007
DRAFTING BOARD BASE

Lorenzo Ubezio, Dietikon, Switzerland, assignor to Reppisch-Werke Aktiengesellschaft, Dietikon, Switzerland

Filed Apr. 28, 1978, Ser. No. 901,210
Int. Cl.[2] F16M *11/00*
U.S. Cl. 248—411 5 Claims

1. A base for a table top, especially a drafting board, comprising first stationary hollow upright column means, second column means slidably supported in said first column means for vertical up and down adjustment of said column means relative to said first column means, substantially horizontally extending table top support means, means operatively connecting said table top support means to said second column means, and slip brake means operatively interposed between said first and second column means, said slip brake means comprising two openings arranged opposite each other in said first column means, brake plate means guided in said openings, U-shaped bail means having spring elastic legs operatively arranged for exerting pressure on said brake plate means, intermediate members operatively interposed between said brake plate means and spring elastic legs of said bail means, relatively flat conical disk means secured on each side below the rotational axis of said U-shaped bail means, said spring elastic legs of said U-shaped bail means running onto said conical disks when the U-shaped bail means is tilted inwardly toward said column means, whereby the load on said brake plate means is relieved

for the elevational adjustment of the second column means and whereby the brake plate means are subjected to the full load



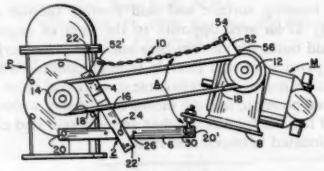
again when the U-shaped bail means is released to thus simultaneously tilt back into its normal position.

4,188,008

FARM PUMP MOUNTING BRACKET

Joseph A. Eagan, Sr., 539 Ford St., West Conshohocken, Pa. 19428

Filed Apr. 17, 1978, Ser. No. 896,718
Int. Cl.[2] F16F *15/00*
U.S. Cl. 248—544 **2 Claims**



1. A mounting bracket assembly for use in conveniently positioning a farm pump associated with a well head which comprises:

a split arm assembly fixed to said well head, said assembly comprising a pair of arms which are pivotally interconnected,

a mounting assembly having portions thereof rotatably associated with said split arm assembly,

said mounting assembly comprising a fixed shaft and a mounting plate rotatable about the shaft;

safety retaining means to interconnect said farm pump and said well head;

eyelet means having a fixed end secured to the mounting plate and an eyelet end the size to overfit the shaft to facilitate rotation of the mounting plate about the shaft; and

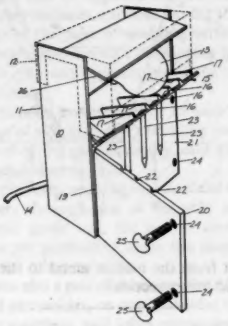
sleeve members or collars on the shaft whereby the sleeve members serve to longitudinally position the mounting plate relative to the shaft by limiting movement of the eyelet means relative to the shaft.

4,188,009

APPARATUS FOR MOLDING CRAYONS AND THE LIKE

Albert C. Gillespie, Box 379 E. Salt Fork Rd. R#1, Lawrenceburg, Ind. 47025

Filed May 15, 1978, Ser. No. 906,116
Int. Cl.[2] B22D *27/02*
U.S. Cl. 249—78 **3 Claims**



1. Apparatus for reclamation of broken and worn crayons and molding thereof into new crayons and the like comprising means for supplying radient and convection heat; a housing surrounding said heat supply means, said housing comprising a base portion and a removable top section; a plurality of reservoirs positioned beneath said heat supply means, each said reservoir comprising a plurality of inwardly and downwardly inclined feed chutes for said broken and worn crayons, the uppermost end of said chutes projecting outwardly from said housing; an orifice in the lowermost, inner end of each said chute; a heat reflective surface secured in said housing above said heat supply means, whereby to reflect heat downwardly into said reservoirs; a plurality of mold cavities arranged beneath said chutes, each said cavity having an open upper end positioned beneath and in communication with one of said orifices; said mold cavities being provided in a pair of releasable mold halves assembled in face-to-face opposed relation, each mold half having a plurality of cavity halves therein in registry with cavity halves in the opposed mold half, said base portion supporting said reservoirs and mold cavities, and said top portion enclosing said heat supply means, said chutes and mold cavities being in alignment and being secured across an open end of said base portion and said chutes being out of communication with one another; and means for opening said mold cavities for releasing new crayons from said mold cavities.

4,188,010

CASTING RISERS

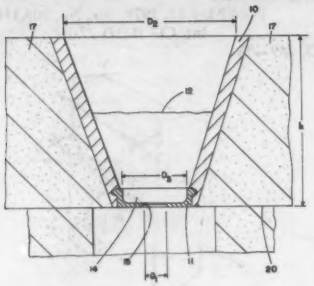
Dennis J. Reiland, St. Paul, Minn., assignor to General Foundry Products Corporation, St. Paul, Minn.

Filed Aug. 26, 1977, Ser. No. 828,232
Int. Cl.[2] B22C *9/00*
U.S. Cl. 249—197 **6 Claims**

1. A riser liner operable for inserting into a mold containing a mold material said riser liner comprising an upper section formed from a material having a thermal conductivity less than the mold material; and

a lower section adjoining said upper section and having an opening therein, said lower section formed from a material which has a thermal conductivity which is greater than the thermal conductivity of said upper section with the thermal conductivity of said lower section being on the order of the thermal conductivity of molten metal poured into said riser liner, said lower section mounted partially in said upper section so that when said upper section is

placed in a mold only said upper section is in contact with the mold material in the mold to thereby prevent the rapid



loss of heat from the molten metal to the mold material through said lower section.

4,188,011

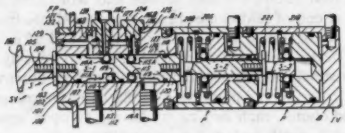
SPOOL VALVE AND PILOT INTERFACE ASSEMBLY

Neil H. Akkerman, New Orleans, La., assignor to Baker Cac, Inc., Belle Chase, La.

Division of Ser. No. 841,951, Oct. 13, 1977. This application Sep. 18, 1978, Ser. No. 943,027

Int. Cl.[2] F16K *31/122*

U.S. Cl. 251—63.4 **6 Claims**



4. In a multi-positionable valve assembly for controling one of pneumatic and hydraulic fluid flow therethrough, said valve assembly comprising a housing, a shuttleable spool element shiftable to plural positions within said housing, valve head and seat means manipulatable relatively with respect to one another by positioning of said shuttleable spool element, the improvement comprising: means extendible to said spool, piston head means within said housing carried around said means extendible to said spool and shiftable with respect to said spool extension means in response to variation in fluid pressure across said piston head, spherical means securable on one of said piston head and said spool extension means; means for urging said spherical means toward the other of said spool extension means and said piston head means; first and second camways defined along one of said piston head means and said spool extension means for travel of said spherical means; and a shoulder on at least one of said piston head means and said spool extension means for definition between said first and second camway and for resistance of travel of said spherical means along one of said camways when said piston means is shifted relative to said spool extension means in one direction, said piston head being shiftable relative to said spool extension means in a first direction in response to one of increase and decrease of fluid pressure for travel relative to said spool extension means to transfer said spherical means from one of said camways to the other of said camways without relative movement between said spool and said housing, said piston head being shiftable relative to said spool extension means in a second direction in response to the other of increase and decrease of fluid pressure for travel relative to said spool extension means to interface said spherical means with said shoulder and carry one of said spool extension means and said piston means to shift one of said spool extension means and said piston head means to another position.

4,188,012

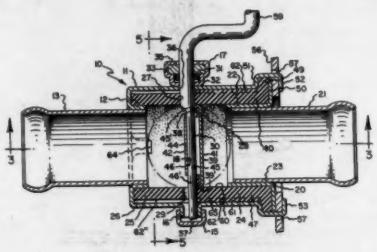
BUTTERFLY VALVE CONSTRUCTION

Jesse R. Johnson, Collins, N.Y., assignor to Coyle E. Knowles, Las Vegas, Nev., a part interest to each and Eugene L. Fisher, Gowanda, N.Y., a part interest to each

Filed Oct. 17, 1977, Ser. No. 842,451

Int. Cl.[2] F16K *25/00*

U.S. Cl. 251—173 **9 Claims**



1. A valve comprising a housing having an inner housing surface, a flexible tubular conduit in said housing having an inside surface and an outside surface and having an inlet portion and an outlet portion, butterfly valve means proximate said inside surface for selectively engaging said inside surface, mounting means mounting said butterfly valve means for movement between a closed position in engagement with said inside surface and an open position spaced from said inside surface, chamber means between said outside surface and said housing for receiving pressurized fluid, means for providing pressurized fluid to said chamber means to thereby enhance the seating engagement between said butterfly valve means and said inside surface when said butterfly valve means is in said closed position, and rib means extending circumferentially about said outer surface for providing engagement between said inner housing surface and said flexible tubular conduit substantially at an area opposite to the area of engagement between said butterfly valve means and said inner surface for limiting expansion of said flexible tubular conduit when said butterfly valve means is in engagement with said inner surface in said closed position, said rib means comprising a plurality of ribs on said flexible tubular conduit and wherein said chamber means are located between said ribs.

4,188,013

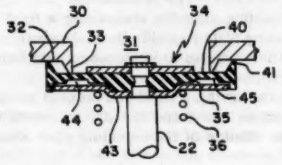
GAS VALVE SEATING MEMBER

Robert J. Battersby, San Pedro, and Paul Dietiker, Redondo-Beach, both of Calif., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 8, 1977, Ser. No. 822,978

Int. Cl.[2] F16K *1/34*

U.S. Cl. 251—175 **1 Claim**



1. A gas valve comprising

a valve body having an inlet opening adapted to be connected to a source of gas under pressure, an outlet opening

adapted to be connected to a gas burning apparatus, and a passageway through the body interconnecting said inlet opening and said outlet opening,

a valve seating surface around an opening forming said passageway between said inlet opening and said outlet opening, said valve seating surface having a flat portion around a periphery of said opening with a first lip in close proximity to said flat portion, said lip surrounding said opening and projecting in a first direction parallel to a center of said opening, and

a flexible valve member attached to a shaft for movement of said valve member, said valve member having a second lip around its periphery, said second lip of said valve member projecting opposite said first direction,

said valve member having a flat surface intermediate said second lip and said shaft whereby upon said valve member engaging said valve seating surface, said first lip of said valve seating surface engages said flat surface of said valve member and said second lip of said valve member engages said valve seating surface adjacent its projecting lip when closing so that two series gas flow seals are provided when said valve member is moved against said valve seating surface,

said flexible valve member has a rigid backing member and a space between the back side of the flat surface of said flexible valve member and said rigid backing member to allow for movement of the flat surface of said valve member when engaged by said first lip of said valve seating surface upon closure of said valve member to provide a seal between said first lip of said seating surface and said valve member all around the surface of said first lip,

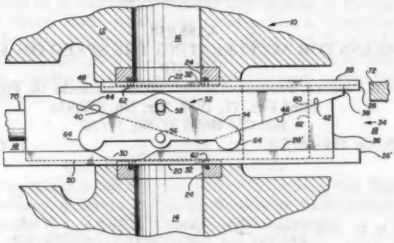
said flexible valve member has inlet gas pressure on its back side to force said second lip against said flat portion of said valve seating surface and said flexible flat surface of said valve member against said first lip to provide said two series seals against gas flow through said passageway.

4,188,014

GATE VALVE WITH POSITION RESPONSIVE INTERLOCK

Patricio D. Alvarez, Rosenberg, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Oct. 11, 1978, Ser. No. 950,494
Int. Cl.[2] F16K *25/00*
U.S. Cl. 251—196 **10 Claims**



1. A gate valve comprising:

a housing having a valve chamber therein and inlet and outlet flow passageways communicating with the valve chamber, a seat about each flow passageway, an expansible ported gate assembly mounted in said chamber for linear movement between open and closed positions relative to the passageways;

said gate assembly comprising a gate member and a segment member, the gate member being connected to a control stem extending to one end of the housing while the segment member floats in depedence on the gate member, said two members having parallel outer sealing surfaces to engage the valve seats and complementary inner surfaces so that the two members interface one another, each of said inner surfaces being a bifurcated surface inclined with respect to the sealing surfaces and diverging away from a point at about its mid-length to form two pairs of wedging surfaces which operate to expand the assembly normally to said seats into sealing engagement therewith, said members having a pair of opposed side surfaces joining said outer and inner surfaces, and also having the aligned ports through one of the pairs of wedging surfaces,

said gate assembly also having a positioning device interconnecting said gate and segment members, said positioning device including

a guide rail secured to the interior of said valve chamber adjacent one of said seats and extending parallel the direction of travel of the gate assembly, said guide rail having an interruption therein, and

a rocker arm pivotally secured to one of the two gate assembly members through one of the side surfaces thereof adjacent said guide rail, the rocker arm having a slot engaging a pin protruding from the corresponding side surface of the other member,

said rocker arm also a pair of downwardly extending lobes at its opposed extremities, on opposed sides of its connection to the two members, said lobes contacting and riding on said guide rail except when one of them enters the interruption in the guide rail and permits the rocker arm to rotate,

whereby during movement of the gate assembly between the two sealing positions at the ends of its stroke, said rocker arm lobes are both in contact with the guide rail and maintain the two members in non-wedging and non-expansive relationship with one another, preventing drag between the moving assembly and the valve seats,

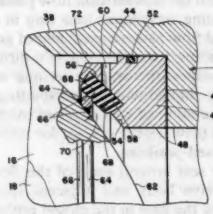
while at the ends of the stroke of the assembly, one of said lobes enters the interruption in the guide rail and permits the two members to be wedged into sealing relationship with the valve seats.

4,188,015

BALL VALVE HAVING IMPROVED SEALING CAPABILITY

Joseph C. Halpine, P.O. Box 2903, Tulsa, Okla. 74101

Filed Mar. 13, 1978, Ser. No. 885,801
Int. Cl.[2] F16K *5/06*
U.S. Cl. 251—315 **3 Claims**



1. A ball valve having improved sealing capability comprising:

(a) a housing having a flow opening therethrough, and having means to connect said flow opening into a pipe system;

(b) a ball having an axial opening therethrough, and axial means to support, and to rotate, said ball in said housing, said axial means at right angle to said flow opening, and means to seal said axial means in said housing, whereby said ball can be rotated from outside said housing so that said axial opening is coaxial with said flow opening;

(c) at least one metal seal ring, and means to seal said seal ring in said housing in a position where it is coaxial with said flow opening, said seal ring having a resilient seat ring inserted into one face thereof; and

(d) at least one circular ridge on the surface of said ball, in such a position that when said ball is turned so that said axial opening is perpendicular to said flow opening, said ridge will be coaxial with said resilient seat ring, and in contact therewith, with a selected force of contact, the circular ridge being in the form of a ring of wire of circular cross-section, the ring of wire being fully exterior of the spherical surface of said ball and welded to ball along both sides of the ring of wire;

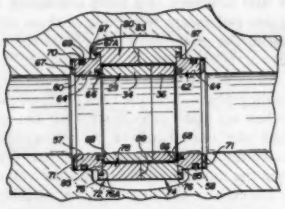
whereby said ring will penetrate a selected distance into, and depress the surface of said seat ring, to seal against a selected fluid pressure in said flow opening.

4,188,016

SPACER CARRIERS FOR FLOATING SEATS IN GATE VALVES

William L. Whaley, Houston, Tex., essignor to ACF Industries, Incorporated, New York, N.Y.

Filed Jun. 29, 1978, Ser. No. 920,607
Int. Cl.[2] F16K *3/00*
U.S. Cl. 251—328 **4 Claims**



1. A gate valve structure comprising:

a valve body having a valve chamber therein and axially aligned upstream and downstream flow passages communicating with the valve chamber;

a bonnet detachably connected to an upper end of the valve body over the valve chamber and permitting access to the valve chamber when removed;

a pair of opposed spacer carriers fitting within the valve chamber, one of the carriers being positioned adjacent the upstream flow passage and the other carrier being positioned adjacent the downstream flow passage, each spacer carrier including an annular base ring in alignment with the associated flow passage and a pair of generally parallel spacers extending from the ring in a direction axially of the flow passages, the spacers on one of said opposed carriers being aligned with and in abutting relation to the spacers on the other of said opposed carriers;

a gate mounted between the spacers for movement between open and closed positions;

and an annular seat around each of the flow passages between the valve body and adjacent spacer carrier for sealing against the gate in the closed position thereof, the seats being spaced from each other by said spacer carriers a predetermined minimum distance.

4,188,017

TENSIONING DEVICE FOR FRAME PIECES

Gerhard Dingler, Ortsstrasse 1, 7274 Haiterback, Fed. Rep. of Germany

Filed Oct. 10, 1978, Ser. No. 949,786
Int. Cl.[2] B25B *1/08*
U.S. Cl. 254—51 **3 Claims**

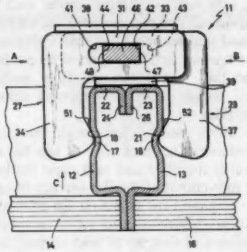
1. A tensioning device for frame pieces having outer surfaces and longitudinal beads, said tensioning device comprising:

two substantially congruent, approximately L-shaped claws formed of cross members and longitudinal members, which are resistant to bending, are parallel to each other, are rigidly connected together and are arranged at a short distance from each other,

two aligned elongate openings in the centre of the cross members which receive a tensioning wedge and which have on one of their cross sides a contact surface for one of the contact sides of the tensioning wedge,

a contact surface for the frame piece, on the cross members on the side that is directed towards the outer surface of the frame piece,

a third claw, which is substantially congruent with the first two claws, guided with its cross member so as to be movable in its longitudinal direction between the cross members of the first two claws but with little play in the two transverse directions and also having an opening which



receives the tensioning wedge and a contact surface for the other contact side of the tensioning wedge on the cross side that is opposite to the first-mentioned contact surfaces,

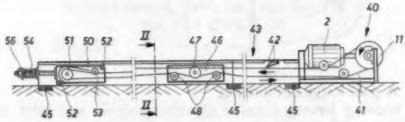
the longitudinal members of the substantially flat claws having, at their end areas, on the areas which are directed towards one another, oblique surfaces whose obliquity corresponds approximately to the angle of the outer flank of the frame piece longitudinal bead, so that when the frame piece outer surfaces rest against the contact surface and the wedge is driven, the inwardly projecting oblique surfaces rest under pressure against the outer flank of the longitudinal bead, and a tensioning wedge with spaced contact surfaces on opposite sides, vertical to the tensioning claws.

4,188,018

MEANS FOR ACCELERATING THE SPEED ON A SKI JUMP

Pertti Pasanen, Fredrikinkatu 61, 00100 Helsinki 10, Finland

Filed Feb. 17, 1978, Ser. No. 878,923
Int. Cl.[2] B61B *11/00, 12/10*
U.S. Cl. 254—175.3 **17 Claims**



1. An apparatus for towing a skier on skis to a ski-jump takeoff at an accelerating speed comparable to that given by a starting tower comprising an endless wire or rope carrying gripping members for grasping by a skier between an end roller and a drive roller, an electric motor with a transmission means for driving said endless wire or rope through said drive roller, said endless wire or rope being guided by rollers enclosed in a housing adapted to be straddled by a skier, the upper face of said housing having a longitudinal slit whereby said gripping members are exposed the length of said longitudinal slit, said

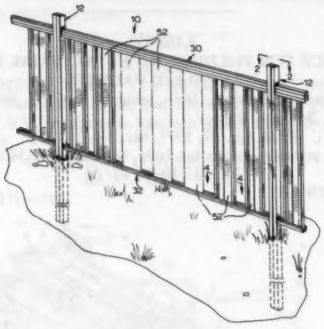
transmission means being adapted to provide a preselected constantly increasing acceleration to said endless wire or rope during the distance of said longitudinal slit through said drive roller.

4,188,019

FENCING CONSTRUCTION

Harold F. Meredith, Mississauga, Canada, assignor to Meredith Manufacturing Co. Limited, Toronto, Canada

Filed Aug. 22, 1978, Ser. No. 935,759
Claims priority, application Canada, Aug. 15, 1978, 309355
Int. Cl.[2] E04H *17/16*
U.S. Cl. 256—24 **8 Claims**



1. A fencing panel comprising:
an upper transverse member shaped to define a downwardly open channel,
a lower transverse member shaped to define an upwardly open channel, both channels having substantially the same width,
and a plurality of elongated upright members spanning between the transverse members, each upright member having its ends lodged in said open channels, each upright member being of resiliently deformable material and having an unstressed, generally V-shaped cross-section which defines an obtuse angle and which cannot be received in said channels when unstressed, the cross-section being shaped to be capable of resilient deformation to enlarge the obtuse angle, so that the cross-section is receivable within said channels, whereby the resiliency of the upright member urges parts of said cross-section against the channels, thereby binding said upright members within the channels.

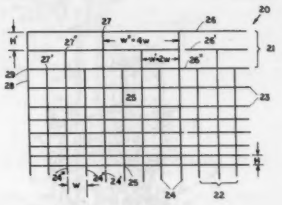
4,188,020

KNOTTED WIRE FENCING

Klaus Herrig, and Heinz Wagner, both of St. Ingbert, Fed. Rep. of Germany, assignors to Acieries Reunies de Burbach-Eich-Dudelange S.A. ARBED, Luxembourg, Luxembourg

Filed Nov. 3, 1977, Ser. No. 848,325
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1976, 2650578
Int. Cl.[2] E04H *17/04*
U.S. Cl. 256—45 **1 Claim**

1. Knotted wire mesh, especially for fencing, comprising:
a first array of mutually parallel spaced-apart longitudinal wires with the spacing between two longitudinal wires being H at one edge of said first array, said wires of said first array having a spacing progressively increasing from H from said one edge of said first array to the opposite edge thereof at which the longitudinal wires have a spacing H′ which is greater than H; and
a second array of single transverse wires reaching from said one edge towards said opposite edge of the mesh and in mutually spaced substantially parallel relation, the two arrays of wires having crossover points at which said transverse wires and said longitudinal wires are tied together by the looping of one of the wires at each crossover point in a single loop about the other wire at such point,
the lengths of successive transverse wires along the second array varying periodically by at least the spacing H′ at said opposite edge of said mesh,
a first transverse wire of said second array extending the full width of said first array between said edges,



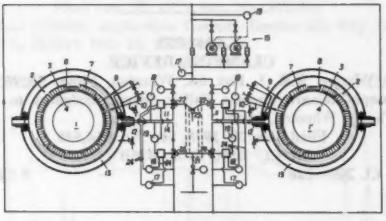
second, third and fourth transverse wires of said second array counting along the second array from said first wire terminating at longitudinal wires inwardly from said opposite edge of said mesh,
said second and fourth transverse wires terminating at a different one of the longitudinal wires than that at which said third wire terminates inwardly from said opposite edges, and
said first, second, third and fourth transverse wires repeating periodically along said second array.

4,188,021

METALLURGICAL VESSEL COOLING AND SAFETY SYSTEM

Alexander Patuzzi, and Manfred Eysn, both of Linz, Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Apr. 14, 1978, Ser. No. 896,458
Int. Cl.[2] C21C *5/28*
U.S. Cl. 266—88 **11 Claims**



1. A metallurgical vessel cooling system, in particular a cooling system for a steel-making converter, including a coolant supply means, cooling elements provided on the wall of the vessel and coolant conduit means for connecting said supply means to said elements, said conduit means and elements being flown through by a coolant from said supply means, the improvement comprising:
a pressure gas line to which the coolant conduit means are adapted to be alternatively connected for emptying the coolant from the conduit means and the cooling elements,
coolant monitoring means contained in the coolant conduit means for checking at least one parameter of the coolant, and
control means actuated by the coolant monitoring means for separating the coolant conduit means from the coolant

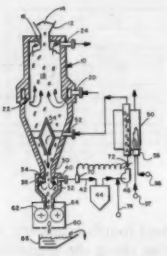
supply means and connecting the coolant conduit means to the pressure gas line whenever the at least one parameter checked deviates from a pre-determined value.

4,188,022

HOT DISCHARGE DIRECT REDUCTION FURNACE

Donald Beggs, and Robert M. Escott, both of Charlotte, N.C., assignors to Midrex Corporation, Charlotte, N.C.

Filed Sep. 8, 1978, Ser. No. 940,806
Int. Cl.[2] F27B *1/20*
U.S. Cl. 266—195 **7 Claims**



1. In an apparatus for the direct reduction of metal oxides to a hot metallized product in solid form comprising a generally vertical shaft furnace having product introducing means at the top thereof, particle removal means at the bottom thereof for creating gravitational flow of particulate burden therethrough, intermediate reducing gas introduction means, and upper spent top gas removal means, the improvement comprising:

a. a seal gas disengaging chamber integrally connected to the discharge outlet of said furnace in direct line of product flow;

b. a seal gas removal means engaging said seal gas disengaging chamber;

c. a seal gas introducing means in the lower portion of said furnace, and

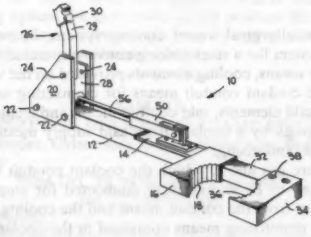
d. means connected to said seal gas removal means and to said seal gas introducing means for cleaning said seal gas and for heating said seal gas to the desired introduction temperature.

4,188,023

CLAMPING DEVICE

Kent Whaley, R.R. 1, Box 6A, Wheaton, Minn. 56296, and Joseph Reinart, Browns Valley, Minn., assignors to Kent Whaley, Wheaton, Minn.

Filed Nov. 29, 1978, Ser. No. 964,649
Int. Cl.[2] B34Q *3/02*; B25B *13/16*
U.S. Cl. 269—228 **9 Claims**



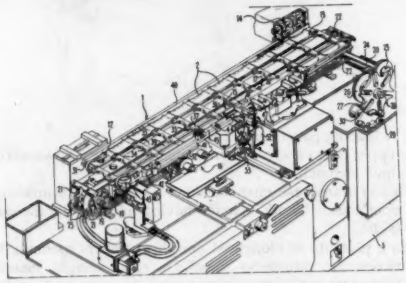
1. A clamping device comprising a base member having a bore and having an attached jaw, the base member including an opening in the wall of the member communicating with the bore, a sliding member partially located within the bore of the base member, a jaw attached to the portion of the sliding member outside the bore of the base member and adapted to cooperate with the jaw attached to the base member to clamp about an object, and a clamping mechanism including a lever pivotably attached to the base member at a point on the lever spaced from the end of the lever, and a connecting linkage pivotably attached near the end of the lever and to the slidable member through the opening in the base member, whereby upon rotation of the free end of the lever towards the base member, the jaw of the slidable member is caused to move towards the jaw of the base member and upon sufficient rotation of the lever toward the base member, the longitudinal axis of the connecting linkage passes through the axis of the pivot connecting the base member and the lever.

4,188,024

DEVICE FOR FOLDING SHEET MATERIAL INTO HINGED LID PACKETS

Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa per Azioni, Bologna, Italy

Filed Apr. 27, 1977, Ser. No. 791,281
Claims priority, application Italy, May 6, 1976, 3423 A/76
Int. Cl.[2] B65H *45/18*
U.S. Cl. 270—67 **3 Claims**



1. A device for folding sheet material, particularly folding peripheral flaps of preshaped or punched pieces of cardboard or the like along a predetermined fold line, said device comprising a support with a slide surface for said preshaped pieces, intermittently operating feed means for feeding the preshaped pieces in a predetermined direction along said slide surface and cyclically stopping such preshaped pieces at predetermined positions, said feed means carrying the preshaped pieces with the fold line oriented approximately in the direction of travel, and folding means arranged to cooperate with each of a succession of said preshaped pieces to rapidly fold the peripheral flaps thereof, and said folding means further comprising an upstanding abutment at one transverse side of the slide surface and a fixed plate at the other transverse side of the slide surface and substantially coplanar therewith to underlie and support the preshaped pieces, the fixed plate being disposed at one of said predetermined positions and having an inner edge adjacent the slide surface and an outer edge remote from the slide surface and extending in the direction of feeding, said outer edge precisely underlying the fold line of each preshaped piece when another peripheral portion of the piece engages the upstanding abutment, said abutment being elongate and extending in the direction of feeding, said folding means also including a folding rod adjacent the outer edge of the fixed plate, the rod lying substantially horizontally and extending perpendicular to said feed direction, first operating means operable in coordinated relation to said feed means to move said rod in a substantially axial direction between a rest position spaced from said plate and edge and a working position in which an end portion of said rod is in lapped relation with the

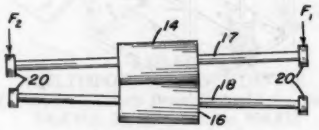
fixed plate and positioned below said plate, and mobile flexing means for fixing each preshaped piece in said predetermined position against said fixed plate and against the abutment during the folding of the flap, and the folding rod extends generally horizontally, said first and second operating means comprise an articulated parallelogram disposed in a plane substantially perpendicular to the direction of feeding, and comprising first and second rocker arms with means pivotally connecting to the folding rod, said arms being hinged to a substantially vertical connecting rod rigid with a fixed frame, a pair of coordinated rotary cams each producing the entire rocking movement of a respective rocker arm, said second rocker arm supporting said rod and moving the rod in the axial direction into and out of lapped relation with the fixed plate, and said first rocker arm moving the rod transversely of itself and above and below the fixed plate.

4,188,025

OFFSET SHEET STACKING APPARATUS

Gary B. Gusfafson, Hilton, and Martin L. Staub, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 23, 1978, Ser. No. 880,416
Int. Cl.² B65H *29/22*
U.S. Cl. 271—314 **5 Claims**



1. Apparatus for offset stacking one sheet relative to a second sheet, comprising:

means for seriatim feeding said sheets including a pair of rotatable rollers mounted to form a sheet propelling nip, said rollers being positionable relative to each other such that in a first position they define a first nonuniform nip contact area and in a second position a second nip contact area which respectively impart different velocity profiles to sheets in the nip; and

means for selectively moving at least one of said rollers between said two positions to form said first and second nip contact areas, so that in the first position the nip imparts a nonuniform velocity profile to one sheet to move it to a first stacking position, and in the second position the nip imparts a different velocity profile to a second sheet to move it to a second stacking position which is offset from said first stacking position.

4,188,026

PAPER SHEET FEEDING DEVICE

Kazumasa Nagai, Hiroshima, Japan, assignor to Ryobi, Ltd., Hiroshima, Japan

Filed Jan. 25, 1978, Ser. No. 872,267
Claims priority, application Japan, Jan. 31, 1977, 52/10917[U]
Int. Cl.² B65H *7/08*
U.S. Cl. 271—148 **11 Claims**

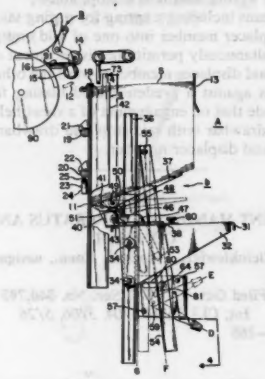
1. A feeding attachment for a printing machine of the type having a vertically travelling support plate for supporting a pile of paper and for maintaining the top sheet in the pile of paper at a substantially constant level for feeding said top sheet into said printing machine, wherein the improvement comprises:

(a) an auxiliary support plate removably pivotably connected to said vertically travelling support plate and moving in the vertical direction therewith for supporting said pile of paper;

(b) pivot means for pivoting said auxiliary support plate with respect to said vertically travelling support plate;

(c) actuating means for controlling the angle of said auxiliary support plate with respect to said vertically travelling support plate;

(d) said actuating means having a guide rail;



(e) pivoting means for adjusting an angle between an axis of travel of said vertically travelling support plate and an axis of said guide rail;

(f) lever means connected to said auxiliary support plate for controlling the pivoting thereof; and

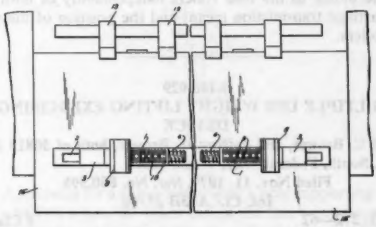
(g) engagement means on said lever means engaging said guide rail and being operative to pivot said auxiliary support plate in proportion to the vertical position of said vertically travelling support plate.

4,188,027

APPARATUS FOR LATERALLY POSITIONING SHEETS IN PRINTING MACHINES OR THE LIKE

Reinhard Naumann, Securiusstr. 32, 727 Delitzsch, German Democratic Rep.

Filed Jun. 10, 1977, Ser. No. 805,391
Claims priority, application German Democratic Rep., Jun. 11, 1976, 193317; Feb. 21, 1977, 197486
Int. Cl.² B65H *9/12*
U.S. Cl. 271—241 **10 Claims**



1. In combination with a machine having a sheet support surface having a lateral stop, an apparatus for laterally positioning a sheet against said stop and comprising:

a displacer member laterally displaceable under said support surface between an outer position extending beyond said lateral stop and an inner position generally underneath and close to said lateral stop;

a suction drawbar limitedly laterally displaceable on said displacer member between a pair of end positions and

having at least one suction aperture exposed at said surface;

means for aspirating air downwardly through said aperture and thereby drawing a sheet overlying said suction drawbar on said surface against said drawbar;

means for laterally displacing said displacer member from said outer position into said inner position and thereby displacing a sheet drawn suctionally against said drawbar laterally against said lateral stop; and

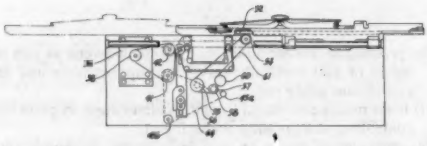
biasing means including a spring for urging said drawbar on said displacer member into one of said end positions and for simultaneously permitting displacement of said drawbar on said displacer member toward the other of said end positions against a predetermined biasing force of such magnitude that on engagement of a sheet held suctionally by said drawbar with said stop said drawbar moves relative to said displacer member.

4,188,028

DOCUMENT HANDLING APPARATUS AND DRIVE CONTROL

Joseph F. Miciukiewicz, Trumbull, Conn., assignor to Pitney Bowes Inc.

Filed Oct. 11, 1977, Ser. No. 840,795
Int. Cl.[2] B65H *5/04, 5/06, 5/26*
U.S. Cl. 271—265 **16 Claims**



1. In a copying machine having a frame, means mounted on the frame defining an illuminating station, a carriage mounted on the frame for carrying a thick or thin original document along a path across the illuminating station, cooperating feed rollers normally positioned in the path of the carriage for feeding a thin original document across the illuminating station, means for moving the cooperating feed rollers in a direction transversely out of the path of said carriage, and a motor mounted on the frame for supplying a drive for the carriage and the cooperating feed rollers, the improvement comprising:

carriage transmission means for delivering the output of the motor to the carriage for reciprocally driving the carriage when the feed rollers are out of the path of the carriage and

feed roller transmission means for delivering the output of the motor to the feed rollers independently of both the carriage transmission means and the position of the feed rollers.

4,188,029

MULTIPLE USE WEIGHT LIFTING EXERCISING DEVICE

Harold E. Brower, and Jeffrey H. Brower, both of 30815 28th Ave. South, Federal Way, Wash. 98003

Filed Nov. 11, 1977, Ser. No. 850,595
Int. Cl.[2] A63B *21/06*
U.S. Cl. 272—62 **8 Claims**

6. A multi-purpose body exercising machine comprising:

a cage-like frame including two pairs of spaced vertical frame members joined by two pair of horizontal support members at the upper and lower ends thereof,

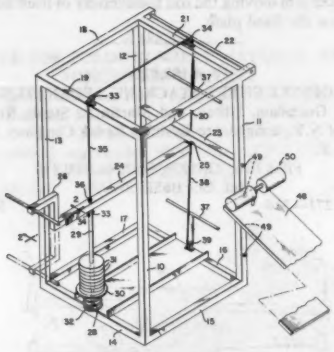
a cross member extending between two of the vertical supports intermediate the upper and lower ends of the vertical supports,

an exercise beam pivotally connected at one end to the cross member for vertical movement about the pivot point, the exercise beam including an adjustable exercise bar on the opposite end capable of being gripped and urged by muscular effort in a vertical direction,

a vertical guide rod secured to one of the lower horizontal support members beneath and laterally spaced from the horizontal cross member to which the exercise beam is secured,

a hollow elongated sleeve member having means thereon for supporting a plurality of vertically stacked weights, the sleeve member and weights mounted for slidable, vertical displacement over the vertical guide rod, the sleeve member detachably secured at one end to the exercise beam,

first cable guide means fixedly mounted to an upper horizontal support member of the frame above the exercise beam and weights,



second cable guide means laterally spaced from the first cable guide means in the same plane thereof fixedly mounted to an upper horizontal support member of the frame,

third cable guide means fixedly mounted to a lower horizontal support member of the frame beneath the second cable guide means and the pivot point of the exercise beam,

a cable segment secured at one end to the weights through the exercise beam and extending through the first, second and third cable guide means, and

a second exercise bar detachably securable to the free end of the cable segment for applying a pulling force on the cable segment by muscular effort to displace the weights and exercise beam vertically.

4,188,030

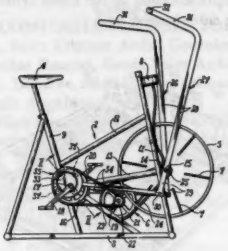
CYCLE EXERCISER

Lindsay A. Hooper, Belgrave, Australia, assignor to Repco Limited, Melbourne, Australia

Filed Aug. 29, 1977, Ser. No. 828,737
Claims priority, application Australia, Oct. 18, 1976, PC7758
Int. Cl.[2] A63B *21/00*
U.S. Cl. 272—73 **16 Claims**

1. A cycle exerciser including; a frame; a seat mounted on said frame; energy absorbing means rotatably mounted on said frame; a substantially horizontal drive shaft having two ends rotatably carried by said frame; first drive means connecting said drive shaft to said energy absorbing means to cause rotation thereof in response to rotation of said drive shaft; a drive crank arm secured to each of two opposite end portions of said drive shaft and extending laterally therefrom in opposite directions; two foot pedal crank arms; connecting means through which each said foot pedal crank arm is fixedly secured to the outer end of a respective said drive crank arm to permit rotation of said drive shaft by foot operation; two handlebar levers mounted on said frame for oscillatory movement; and second drive means connecting the outer end of each said drive crank arm to a respective one of said handlebar levers so that said

drive shaft is caused to rotate in response to said oscillation of the handlebar levers; said second drive means being connected



to said connecting means so as to be interposed between the outer end of each said drive crank arm and the adjacent end of the respective foot pedal crank arm.

4,188,031

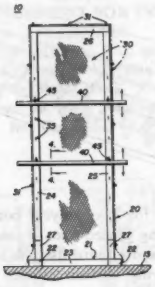
MULTISPORT PRACTICE DEVICE

Robert Z. Fox, 5004 Valerie Drive, Crystal Lake, Ill. 60014

Filed Oct. 26, 1978, Ser. No. 954,873

Int. Cl.[2] A63B *69/40*

U.S. Cl. 273—26 A **9 Claims**



1. A multisport practice device for defining a target for arresting the flight of a ball or other projectile, said device comprising a base, a pair of elongated laterally spaced-apart support posts mounted on said base and extending vertically upwardly therefrom, a net mounted on said support posts and closing the space therebetween for intercepting and arresting the flight of an associated projectile, a plurality of hook members secured to and vertically spaced apart along each of said support posts so that each hook member on one of said support posts is substantially in horizontal alignment with a corresponding hook member on the other support post, and two crossbar members each having two eyelet members secured thereto respectively adjacent to the opposite ends thereof, said eyelet members on each crossbar member being adapted respectively to receive therein associated horizontally-aligned ones of said hook members for adjustably mounting said crossbar members at vertically spaced-apart locations on said support posts to define therebetween a variable target area.

4,188,032

NICKEL-PLATED GOLF CLUB SHAFT MADE OF FIBER-REINFORCED PLASTICS

Seiichi Yanagioka, No. 284-1, Shindo, Hiratsuka-shi, Kanagawa-ken, Japan

Filed Apr. 25, 1977, Ser. No. 790,343

Claims priority, application Japan, May 19, 1976, 51-62573[U]

The portion of the term of this patent subsequent to May 30, 1995, has been disclaimed.

Int. Cl.[2] A63B *53/10*

U.S. Cl. 273—80 R **1 Claim**

1. A golf club shaft comprising and elongated body having one end adapted to be gripped and an opposite end adapted to be attached to a golf club head, said elongated body composed of fiber-reinforced plastic material having on substantially its entire outer surface a metallic plating selected from the group consisting of nickel and nickel based alloys.

4,188,033

TETHERED BALL GAME WITH HELIX SUPPORT

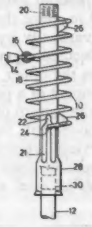
John L. Wells, Rotorua, New Zealand, assignor to Zimm-Zamm Aktiengesellschaft, Zug, Switzerland

Filed Aug. 19, 1977, Ser. No. 826,183

Claims priority, application United Kingdom, Aug. 26, 1976, 35636/76

Int. Cl.[2] A63B *67/10*

U.S. Cl. 273—413 **2 Claims**



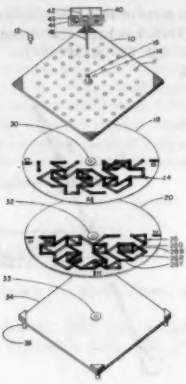
1. Apparatus for a game comprising a pole supporting a helix and a ball on a line, the other end of the line being coupled by a line attachment to the helix, there being the possibility of relative movement between the line attachment and the helix according to the direction in which the ball is hit, characterised by the provision of a slidable element inside the helix, the element being supportable in a cocked position, and triggering formations are provided at each of the end positions of the helix, the triggering formations being releasable for abrupt uncocking action by movement of the line attachment into either of its two end positions, to provide a perceptible signal.

4,188,034

SKILL BOARD GAME

Leonard H. Dempsey, and Linda S. Adrian, both of 13217 1st South, Seattle, Wash. 98134

Filed Dec. 1, 1977, Ser. No. 856,303
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—248 **5 Claims**



1. A skill board game having a transparent upper planar member provided with a partial first allowed direction-movement pattern, and at least one lower planar member underlying the upper planar member and having a partial second allowed direction-movement pattern which complements the direction-movement pattern of the upper planar member, said planar members being movable to change the alignment of the direction movement patterns between the two planar members for varying the combined allowed direction of movement,

a stationary transparent top board having piece receiving indicia, and revealing the patterns of said upper and lower planar members,

pieces movable along the top board for following the allowed direction-movement pattern, and

means for selecting the choice of alignment between the two planar members and the number of moves allowed for the pieces, the partial first and second allowed direction-movement patterns each including a series of independent segments arranged in random directions and in random multiples of allowed interconnected segments wherein a partially completed random path of more than one segment interconnected in more than one direction is provided by combining vertically and horizontally overlying and visually interconnected segments with each selection of alignment between the upper and lower planar members whereby a movement of a piece on the top transparent board following the pattern of partial first and second allowed direction-movement interconnected segments can be moved in varying directions and in varying numbers of segments dependent upon the means for selecting the number of moves allowed and selecting the planar member alignment.

4,188,035

CHESS WORD GAME

Robert A. Metzler, Jr., 400 W. 43rd St., Apt. 13-H, New York, N.Y. 10036

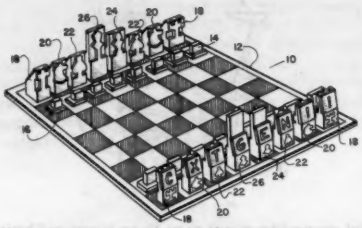
Filed May 8, 1978, Ser. No. 903,830
Int. Cl.[2] H63 *3/02*
U.S. Cl. 273—260 **6 Claims**

1. A chess word game comprising:

checkered board game;

a plurality of pawns;

a plurality of game pieces, each having on the front thereof a conventional chess symbol in three-dimensions and on the upper part of the back thereof a slot for removably receiving an insert bearing a letter indicia, each game piece having below the respective slot thereof a two-dimensional representation of the chess symbol disposed on the opposite side thereof; and



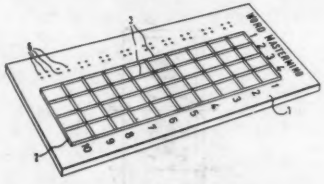
a plurality of inserts, each bearing a letter indicia whereby, when an insert is disposed in each game piece, the game pieces may be moved on said board according to standard chess moves such that the indicia-bearing inserts spell out a multiple letter word.

4,188,036

BOARD GAME WITH LETTER SHAPED PLAYING PIECES

Edward J. Jones-Fenleigh, Oadby, England, assignor to Invicta Plastics Limited, Oadby, England

Continuation-in-part of Ser. No. 752,534, Dec. 20, 1976, abandoned. This application Feb. 15, 1978, Ser. No. 877,886
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—265 **2 Claims**



1. A board game for two players comprising a board, a holder, a set of playing pieces, a set of marking elements, a set of scoring elements and a word list; the board having a common horizontal playing surface divided into a plurality of similar rows of individual playing areas, each area having a slot to receive a playing piece, a score area and marking areas, each of the marking areas being associated with a row of playing areas, each marking area being adapted to receive a maximum number of marking elements equal to the number of playing areas in a row, the scoring area comprising lines of apertures, each aperture being adapted to receive a scoring element; the holder having a row of target playing areas, each target playing area having a hole to receive a playing piece, and a separate shield, the number of target playing areas in said holder row being equal to the number of playing areas in a row of the board, and the shield being removably locatable over said target playing areas by a first player to shield playing pieces mounted thereon from a second player, the playing pieces being a set of moulded pieces each in the configuration of a letter of an alphabet, each piece having a tongue at a base portion thereof, said tongue being receivable in a selected slot in one of the playing areas of the board or one of the target playing areas of the holder so that each piece stands independently with respect to its playing area; and the word list having

thereon a list of words from which a code word may be chosen by the first player as a target for the second player.

4,188,037

COMPOSITE FLEXIBLE JOINT

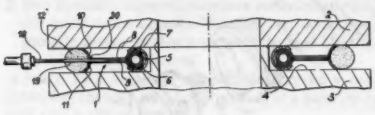
Claude Abbes, Saint Etienne; Andre Gournier, Saint Priest en Jarez; Christian Rouaud, Bourg Saint Andeol, and Raymond de Villepoix, Donzere, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 21, 1978, Ser. No. 972,009

Claims priority, application France, Jan. 6, 1978, 78 00290; May 25, 1978, 78 15555

Int. Cl.² F16J *15/12*

U.S. Cl. 277—2 **8 Claims**



1. A metalloplastic flexible annular joint, wherein it comprises a first metal ring constituted by an inner metal spring with contiguous turns closed on itself and surrounding said spring, at least one metal envelope in which is embedded the spring, said envelope being extended by two parallel planar faces which extend in a transverse equatorial plane of symmetry of the joint, said faces having flared extensions moving away from said plane at a predetermined distance from the spring to partly surround a second solid elastomer plastic ring which is coaxial to the spring in such a way as to create between the two rings a sealed enclosure of limited volume which can be used for controlling the sealing of the joint.

4,188,038

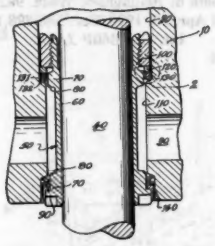
SEAL ARRANGEMENT FOR INTERSECTING CONDUITS

Friedrich E. Goedicke, Trafford, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 10, 1968, Ser. No. 721,138

Int. Cl.² B65D *53/00*

U.S. Cl. 277—64 **2 Claims**



1. A seal assembly for sealing first and second intersecting conduits from each other, comprising:

a housing containing the conduits, the first conduit having an inwardly protruding wall section intersected by the second conduit, the ends of the protruding wall section defining first and second shoulders;

a stationary sleeve in the first conduit, said sleeve having a central portion narrower than the protruding wall section of the first conduit, and first and second end portions of larger external diameter than the central portion, each end portion being placed adjacent to one of the shoulders of said protruding wall section, the first end portion having attached to it a threaded extension and the second end portion having a flange at its outer extremity;

a first flexible sealing means surrounding the first end portion of the sleeve and abutting the first shoulder of said protruding wall section;

a second flexible sealing means surrounding the second end portion of the sleeve and lying between the second shoulder of said protruding wall section and the flange; and

a single loading nut for simultaneously tightening the first and second flexible sealing means, the loading nut being attached to said threaded extension.

4,188,039

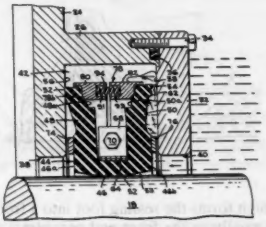
BULKHEAD SHAFT SEAL

Edward J. Krisak, and Stephen Strozak, both of Indiana, Pa., assignors to FMC Corporation, San Jose, Calif.

Continuation-in-part of Ser. No. 600,747, Jul. 30, 1975, abandoned. This application Oct. 15, 1976, Ser. No. 732,833

Int. Cl.² F16J *15/34*

U.S. Cl. 277—95 **7 Claims**



3. Apparatus for blocking the flow of fluid from one compartment to an adjacent compartment and alternatively from said adjacent compartment to said one compartment through a partition having a rotatable shaft extending therethrough, the apparatus comprising a housing in said partition having a pair of spaced wall sections, said wall sections having aligned openings on an axis to receive with clearance said shaft as it extends from said one compartment to said adjacent compartment, said housing defining in said partition an internal totally enclosed chamber except for said openings and said housing defining with said partition a fluid tight barrier between said compartments except for said openings, a resilient seal having a hub portion and a pair of spaced flanges, a band around said hub portion and between said flanges to clamp the hub portion securely to the shaft, said flanges extending radially outwardly from said hub portion beyond the boundaries of said openings in closely spaced relation to said wall sections, one of said flanges pressed into sealing contact with the wall section adjacent thereto on the increase of fluid pressure within said chamber above the pressure in the compartment on the other side of the wall from said one flange to block the flow of fluid between said compartments and, alternatively, the other of said flanges pressed into sealing contact with the wall section adjacent thereto on the increase of fluid pressure within said chamber above the pressure in the compartment on the other side of the wall from said other of said flanges to block the flow of fluid between said compartments.

4,188,040

SEALING RING

Franz-Josef Wolf, and Hans J. Kunze, both of Bad Soden-Salmunster, Fed. Rep. of Germany, assignors to Firma WOCO Franz-Josef Wolf & Co., Bad Soden-Salmunster, Fed. Rep. of Germany

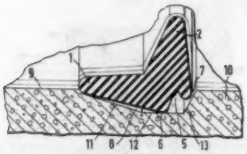
Filed Apr. 6, 1977, Ser. No. 785,204

Int. Cl.² F16L *21/02*

U.S. Cl. 277—207 R **15 Claims**

1. A sealing ring of elastic material for a plug-in type pipe

joint made up of two concentrically interfitting pipe elements of a mineral material in the case of which the sealing ring can be preassembled by insertion into the outer pipe element or socket before the insertion of the inner pipe element or spigot characterised in that (a) the sealing ring by and large has a substantially V-shaped axial section profile with the formation of two annular lips consisting of a support lip and a sealing lip in that (b) the support lip in the unstressed condition of the sealing ring, when the sealing ring is mounted in the socket, lies substantially axially in the opposite direction to the direction of the insertion of the spigot and has a clearance internal diameter, which is larger than the maximum external diameter, within the range of manufacturing tolerance, of the spigot, in that (c) the sealing lip in the unstressed condition of the sealing ring, when the sealing ring is mounted in the socket, extends substantially radially and has a clearance internal diameter, which is smaller than the smallest external diameter within the range of manufacturing tolerance, of the spigot, in that (d) the sealing ring has a sealing foot, which is opposite to the angle included by the support lip and the sealing lip, in that in the sealing foot of the sealing ring a sealing foot annular groove is



provided which forms the sealing foot into a front sealing foot lip which is axially to the front and provides a sealing action against external pressure and forms an axially rear sealing foot lip which provides a sealing action against internal pressure, and said sealing ring can be fixed by its sealing foot by dint of an annular groove constructed in an inner wall of the socket in order to prevent axial displacement of the sealing ring in the insertion direction of the spigot and in that (e) the sealing ring on insertion of the spigot into the socket can be inwardly axially tilted through the radial plane defined substantially by the sealing foot of the sealing ring in such a manner that the support lip and the sealing lip stand substantially symmetrically with respect to the radial plane, and when the spigot is inserted the radial clamping and distortion of the sealing ring in the case of the largest sealing gap permitted in the manufacturing tolerance range the support lip makes a sealing engagement with the external casing of the spigot with respect to external pressure, the sealing lip makes sealing engagement with the external casing of the spigot with respect to internal pressure and the sealing foot makes sealing engagement with the floor of the annular groove or on the inner wall of the socket with respect to internal and external pressure.

4,188,041

MOTOR QUICK-CHANGE CHUCK SYSTEM FOR TOOL HAVING CYLINDRICALLY SHAPED ADAPTER PORTION

Mark S. Soderberg, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 799,407, May 23, 1977, abandoned. This application Aug. 8, 1978, Ser. No. 932,093
Int. Cl.[2] B23B *3/04, 31/22*
U.S. Cl. 279—75 **2 Claims**

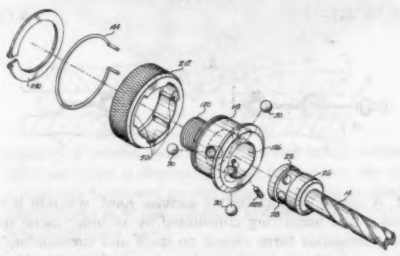
1. In combination:

a tool having a cylindrically shaped adapter portion;

a tool-holding chuck assembly having a generally cylindrically shaped body member including a first end portion adapted for coupling to a portable motor and a hollow second end portion for receiving said cylindrically shaped adapter portion in slip fit relationship therewith;

said cylindrically shaped tool adapter portion including an array of six spherically shaped dimples circumferentially disposed in the outer surface of said cylindrically shaped adapter portion;

said tool-holding chuck assembly including three spherically shaped ball elements, and a rotary spring-biased collar member rotatable in a counterclockwise direction when viewing said tool-holding chuck assembly from the open end thereof, thereby permitting disengagement of said three spherically shaped ball elements by allowing said three spherically shaped ball elements to move outward radially from said spherically shaped dimples, said rotatable spring-biased collar member further adapted to be



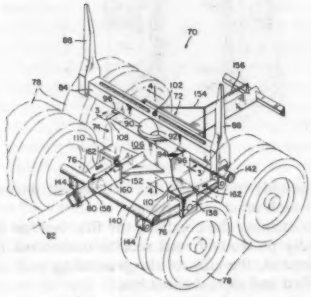
released from confining said three spherically shaped ball elements between a raised inner surface of said collar member and said spherically shaped dimples, said generally cylindrically shaped body member including a fixed stopping member for preventing rotation of said collar member beyond the position required for release from confinement of said three spherically shaped ball elements, said fixed stopping member pressed into said cylindrically shaped body member, and said rotary spring biased collar member including a biasing spring having a first end anchored to said fixed stopping member and a second end hooked over one of a plurality of spline like recesses in said cylindrically shaped collar member.

4,188,042

LOG TRAILER ASSEMBLY

Brian L. Pederson, 2411 Yew St., and Stephen F. Pederson, 2535 Michigan St., both of Bellingham, Wash. 98225

Filed Apr. 20, 1978, Ser. No. 898,109
Int. Cl.[2] B60P *3/40*
U.S. Cl. 280—404 **9 Claims**



1. A trailer assembly adapted to carry a load, such as a load of logs comprising:

a. a chassis frame having a longitudinal axis, a lateral axis and a vertical axis, said chassis frame comprising:

1. a central body portion having a top, bottom and two sides,
2. two laterally spaced leg portions connected to the bottom of said body on opposite sides thereof,
3. two laterally spaced shoulder portions, located at the top of said body portion on opposite sides thereof,

b. a load carrying bunk member positioned above said frame and extending laterally over said frame,

c. support means to support said bunk member on said frame, said support means comprising:

1. a main rotary thrust bearing mounted to the top of said body portion at the center thereof and transmitting major thrust forces from said bunk member directly to said body portion in a manner to provide major support for said bunk member,
2. two auxiliary support members mounted to said shoulder portions on opposite sides of said thrust bearing to provide direct auxiliary support for said bunk member on side portions thereof,

d. a reach tube structure adapted to receive a reach and extending through said body portion at a location beneath said rotary thrust bearing,

e. plate support means centrally mounted in said body portion and rigidly connected to one another to form a support column which extends vertically from said rotary thrust bearing downwardly to transmit force loads from said rotary thrust bearing downwardly and outwardly to said leg portions,

f. a pair of walking beams mounted one to each of said leg portions, each walking beam having a center portion mounted for rotation to its related leg portion, and forward and rear ends adapted to be rotatably connected to forward and rear axles,

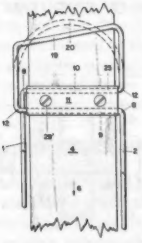
g. said walking beams being adapted to carry strain gauge means thereon to measure forces transmitted from said bunk, through said support means to said chassis frame and thence to said walking beams, as a means of determining the weight of the load carried on the bunk.

4,188,043

SKI BRAKE APPARATUS

Günter Schwarz, Au, Zürich, Switzerland, assignor to S.A. Etablissement Francois Salomon & Fils, Annecy, France

Division of Ser. No. 595,791, Jul. 11, 1975, Pat. No. 4,036,509.
This application Apr. 25, 1977, Ser. No. 790,178
Claims priority, application Switzerland, Jul. 17, 1974, 9863/74; Jan. 14, 1975, 478/75
Int. Cl.[2] A63C 7/10
U.S. Cl. 280—605 **7 Claims**



1. A brake apparatus for a ski having opposite lateral sides and upper and lower surfaces, said brake being securable to the upper surface of said ski and comprising:

two pivotable brake arms, each arm being respectively located adjacent one of the opposite sides of the ski;

a common spring bracket located above the upper surface of the ski and having bent ends defining respectively a first shaft connected with a first brake arm and a second shaft connected with the second brake arm, said shafts forming pivot axis for the corresponding brake arm and being arranged substantially parallel to the upper surface of the ski, transverse to the longitudinal axis thereof and in spaced relationship to one another in the lengthwise direction of the ski; and

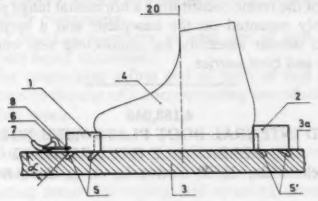
means for pivotally mounting the brake arm shafts on the ski so as to enable pivoting of said brake arms from a preparatory position in which said brake arms lie above the lower surface of the ski into a braking position in which the brake arms extend at least partly beneath the lower surface of the ski.

4,188,044

CONNECTING ARRANGEMENT FOR THE DETACHABLE MOUNTING OF A BINDING ON SKIS

Norbert Kautzky, Schoffelgasse 26-28, A-1180, Vienna, Austria

Filed Feb. 17, 1978, Ser. No. 878,761
Claims priority, application Austria, Feb. 18, 1977, 1095/77
Int. Cl.[2] A63C 9/00
U.S. Cl. 280—611 **21 Claims**



1. A connecting arrangement for detachably mounting a binding member consisting of a front binding device and a rear binding device on a ski member having an upper surface, which comprises

(a) connecting studs affixed to one of said members, the studs

(1) extending obliquely to the upper surface of the ski member and enclosing therewith an acute angle substantially less than 90° in planes extending perpendicularly to the upper ski member surface and parellel to a longitudinal center line of the ski member when the binding member is mounted thereon,

(2) the studs associated with the front binding device extending in one direction and the studs associated with the rear binding device extending in another direction, and

(3) the studs associated with the front binding device being arranged substantially symmetrically with respect ot the studs associated with the rear binding device in relation to a plane of symmetry extending perpendicularly and transversely to the upper ski member surface between the front and rear binding devices, and

(b) the other one of said members defining bores arranged to receive the connecting studs whereby the studs may be plugged into the bores.

4,188,045

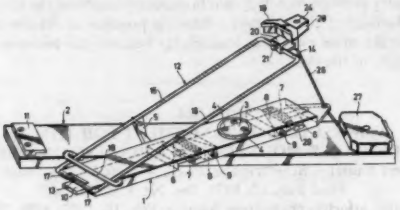
SAFETY SKI BINDING

Hannes Marker, Hauptstrasse 51-53, 81 Garmisch-Partenkirchen, Fed. Rep. of Germany

Filed Jun. 23, 1978, Ser. No. 918,452
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1977, 2731897
Int. Cl.[2] A63C 9/08
U.S. Cl. 280—614 **7 Claims**

1. A safety ski binding comprising a baseplate, which is mountable on an upper surface of a ski adjacent to a heel of a skiing boot to extend normally in the longitudinal direction of the ski; means for mounting the baseplate on the upper surface so that the baseplate is rotatable on a vertical axis; a first adjustable resistance for opposing rotation of the baseplate; and a

boot carrier, which is hinged to the baseplate at the forward end of the latter and holds a skiing boot so that the latter is only arbitrarily detachable; a second adjustable resistance for opposing lifting of the rear end of said boot carrier from the baseplate, the boot carrier comprising a frame that extends



across the baseplate adjacent to the skiing boot, a forward end member of the frame constituting a horizontal hinge pin, which is rotatably mounted on the baseplate; and a spring-loaded cable and winder assembly for connecting rear ends of the baseplate and boot carrier.

4,188,046

SKI AND INTEGRAL BOOT PLATE WITH TOE PIECE AND RELEASABLE HEEL BINDING

John Fleckenstein, 20580 Enterprize Ave., Brookfield, Wis. 53005

Filed Apr. 19, 1978, Ser. No. 897,587
Int. Cl.[2] A63C 9/08
U.S. Cl. 280—618 **1 Claim**

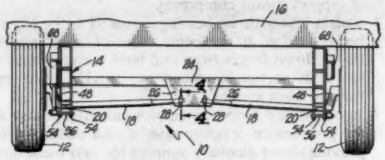
1. A ski for specialty skiing comprising a runner having a maximum length of about 20" and having a front tip curved upwardly on a radius, a boot plate formed integrally with said runner including a plurality of upstanding lengthwise ribs on the runner, an upstanding toe piece mounted on the boot plate, a heel anchor device pivotally secured in the rear portion of said boot plate, said anchor device including a flexible cable having a pivot mounting device in the boot plate, an anchor member pivotally mounted in the cable, said cable having turn buckles respectively connecting the opposite ends thereof with said pivot mounting device, said pivot mounting device being threaded into the boot plate, a plurality of longitudinally spaced threaded openings into the opposite sides of the boot plate to receive the pivot mounting device, said pivot mounting device including a pair of angle shaped members entering said boot plate from opposite sides thereof and each having threads for engagement by said turn buckles and threads for engagement in the boot plate disposed respectively on right angled portions of the angle shaped members, said toe piece being separate from said boot plate and adjustably mounted on said lengthwise ribs, said toe piece including a toe binding piece and a toe block piece having an upstanding portion containing a plurality of vertical openings, vertical fastening members extending through said openings threaded into said boot plate, and a plurality of longitudinally spaced threaded openings formed in enlargements of said ribs affording a plurality of longitudinally adjusted positions to receive said fastening members.

4,188,047

TRAILER SUSPENSION

John C. Crean, San Juan Capistrano, and Bill Stroppe, Long Beach, both of Calif., assignors to Fleetwood Enterprises, Inc., Riverside, Calif.

Filed May 30, 1978, Ser. No. 910,464
Int. Cl.[2] B62D 21/00
U.S. Cl. 280—678 **10 Claims**



1. In a trailer having a chassis, a plurality of wheels and suspension means for connecting said wheels to said chassis the improvement which comprises:

said suspension means comprising a separate suspension structure for each of said wheels,

each of said suspension structures including an elongated rod-like member serving as an axle, a spring, a torsional energy absorption means for use in absorbing torsional energy and a mounting means for use in securing said torsional energy absorption means to said chassis,

said member having a chassis mounting end and a wheel mounting end,

one of said wheels being rotatably mounted on said wheel mounting end,

said spring being connected to said wheel mounting end and to said chassis and serving to resiliently support said wheel mounting end on said chassis,

said mounting means being located on said chassis remote from said wheel and said wheel mounting end,

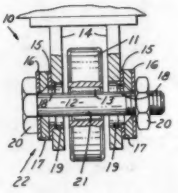
said torsional energy absorption means being connected to said chassis mounting end and to said mounting means so as to absorb torsional energy transmitted through said elongated member said energy absorption means being composed of a resilient, elastomeric body.

4,188,048

WHEEL SUSPENSION

Bernard Haung, Canton, Mich., and Evgeny I. Rivin, Windsor, Canada, assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 2, 1978, Ser. No. 930,440
Int. Cl.[2] B60G 11/24
U.S. Cl. 280—688 **11 Claims**



1. A wheel suspension for movable object including:

a pair of spaced side walls having opposed openings;

an elongated axle extending between said side walls and through said opposed openings so that said axle has end portions adjacent said side walls;

a wheel rotationally mounted on said axle between said side walls;

a pair of resilient means coupling the end portions of said axle to an adjacent one of said side plates, said resilient

means each including a pair of spaced cover plates having an elastomer therebetween and attached to said cover plates, a first of said cover plates being attached to said axle and a second of said cover plates being attached to one of said side walls so that movement of said axle in a radial direction with respect to said side walls applies a shear force to said elastomer and a damping force to the wheel suspension;

said first of said cover plates is annular and has an inner diameter substantially equal to the diameter of said axle so that radial movement of said axle causes corresponding radial movement of said first cover plate thereby applying a shear force to said elastomer and thus resisting motion of said axle with respect to said side plate and;

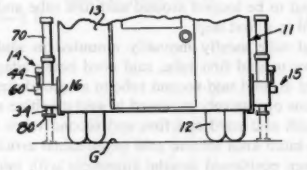
said second of said cover plates is annular and has an inner diameter sufficiently larger than the diameter of said axle to permit some radial movement of said axle which movement is limited by interference with the innermost boundary of said opening in said side plate and said inner diameter of said second cover plates.

4,188,049

ADJUSTABLE STABILIZER FOR MOTOR VEHICLES AND THE LIKE

Robert M. Kimbro, 7752 Garvey Ave., Rosemead, Calif. 91776

Filed May 24, 1978, Ser. No. 908,809
Int. Cl.[2] B60S 9/02
U.S. Cl. 280—766 **9 Claims**



1. An adjustable support comprising

a support post,

a device movable along said post,

a first one-way clutch for preventing relative movement between said post and said device in one direction and permitting relative movement in the opposite direction,

a second one-way clutch for preventing relative movement between said post and said device in said opposite direction and permitting relative movement in said one direction,

selectively settable means for releasing one or the other of said clutches,

a slider movable lengthwise of said post,

a third one-way clutch for preventing relative movement between said post and said slider in said opposite direction and permitting relative movement in said one direction,

an adjusting lever,

first pivot means pivotally connecting said lever to said slider,

second pivot means pivotally connecting said lever to said device, and

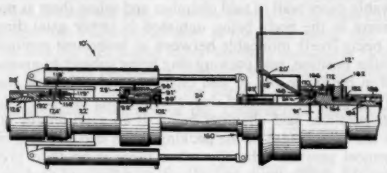
means for oscillating said lever whereby to advance said device along said post upon movement of said lever in one direction about said first pivot means and to advance said slider along said post upon movement of said lever in an opposite direction about said second pivot means.

4,188,050

REMOTE-CONTROLLED FLOWLINE CONNECTOR

Glen E. Lochte, Cypress, Tex., assignor to FMC Corporation, San Jose, Calif.

Filed Oct. 25, 1977, Ser. No. 844,564
Int. Cl.[2] F16L 55/00
U.S. Cl. 285—24 **16 Claims**



1. A remotely controllable connector for interconnecting the ends of a pair of subsea flowline pipes using remote control, said connector comprising:

a pair of coupling members, at least one of said coupling members being extendable;

means for connecting a first end of each of said coupling members to the end of a corresponding one of said pair of flowling pipes;

a pair of orienting cones;

means for connecting each of said cones to a second end of a corresponding one of said coupling members, said cones providing means for urging said coupling members into axial alignment as said coupling members are moved toward each other;

power means for extending said extendable coupling member to move said second end of said extendable coupling member in a generally axial direction toward said second end of the other coupling member;

universal joint means connected between said first end of a first coupling member and said first end of a second coupling member to provide axial alignment of said second end of said first coupling member with said second coupling member as said cones urge said coupling members toward axial alignment;

means for clamping said second end of said first coupling member to said second end of said second coupling member; and

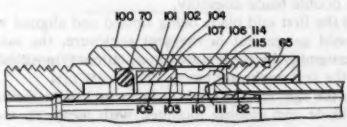
an annular seal interposed between said second ends of said coupling members for providing a fluid-tight seal therebetween.

4,188,051

TUBE COUPLING

Donald G. Burge, Plainwell, Mich., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 789,826, Apr. 22, 1977, abandoned. This application Mar. 9, 1978, Ser. No. 884,872
Int. Cl.[2] F16L 17/02, 21/08, 33/16, 37/08
U.S. Cl. 285—104 **6 Claims**



1. A preassembled coupling for tubes wherein a final fluid tight joint may be made solely by insertion of a tube therein, said coupling comprising a body having a first bore for receiving a tube, a chamber axially outwardly of and adjacent the first bore and in which a packing ring is received and sealingly

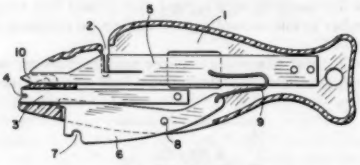
engages the tube and a radially outer cylindrical wall of said chamber, a second bore in the body axially outwardly of the chamber and in which a sleeve is received, and an internal thread axially outwardly of the second bore, a transverse shoulder at the bottom of the second bore, a nut threadably engaged with said internal thread, engaged abuttment surfaces on the body and nut fixing the axial position of the nut relative to the body, said sleeve having an inner end wall forming a movable outer wall of said chamber and when there is no fluid pressure in the body being unbiased in either axial direction and being freely moveable between an innermost position and an outer position, said packing ring being subject to pressure of fluid in the inner end of said chamber and moveable thereby into engagement with said sleeve for moving said sleeve to said outer position, said chamber being of an axial length greater than the axial length of the packing when said sleeve is in said innermost position whereby when there is no fluid pressure within the axially inner end of said chamber said packing may move to said inner end and be out of contact with the sleeve when the sleeve is in said innermost position, said nut having a bore therethrough that terminates in a frusto-conical cam surface at the inner end of the nut, said sleeve having a circumferentially continuous inner end surface and an inwardly facing second surface that engages said shoulder when the sleeve is in said innermost position, said sleeve having longitudinal slits at its outer end forming a plurality of circumferentially spaced fingers, said fingers having a radially inwardly projecting rib of smaller diameter then the tube prior to insertion of the tube within the coupling, said fingers having a flare mouth at their outer ends, said sleeve when in said innermost position being out of contact with said cam surface, said sleeve being in engagement with said cam surface when said sleeve is in said outer position whereby the outer ends of said fingers and said rib are contracted radially inwardly by said cam surface and the rib grips the tube for retaining the tube within the coupling.

4,188,052

LINE THREADING AND CUTTING DEVICE

Charles W. Browning, 4645 E. 57th St., Tulsa, Okla. 74135

Filed Aug. 10, 1978, Ser. No. 932,567
Int. Cl.[2] D04G *5/00*
U.S. Cl. 289—17 **7 Claims**



1. An improved Line Threading and Cutting Device comprising an enclosure case, the said enclosure case having a gauge slot and a groove in the outer structure; the said enclosure case having means therein suitable for mounting;

(a) a lure holder with means for threading a line through an eyelet of a lure,

(b) a double blade assembly,

(1) the first said blade being slotted and aligned with the said gauge slot in the said enclosure, the said blade assembly being mounted in a stationary position within the said enclosure case;

(2) the said second blade being attached to the said first blade and slidably mounted with means to move the said second blade over the said first blade, the end of the said second blade moving over the said slot in the first said blade to form a cutting edge;

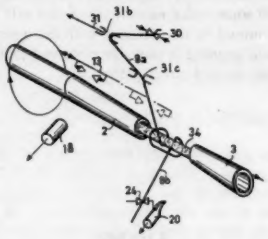
(c) a spring loaded lever pivotally mounted in the said enclosure case for releasing a line looped over the said enclosure case, the said line passing over the said groove in the said enclosure case and over a slot in the said spring loaded lever, the said line being released to form a knot so as to secure the said line to said lure.

4,188,053

MACHINE FOR AUTOMATICALLY TYING THE ENDS OF SAUSAGES AND THE LIKE

Yves A. Pujol, Albi, France, assignor to S.A.T.E.M. St d Application des Techniques Electriques et Mecaniques, Albi, France

Continuation-in-part of Ser. No. 733,402, Oct. 18, 1976, abandoned. This application Aug. 22, 1977, Ser. No. 826,707
Claims priority, application France, Dec. 10, 1976, 76 30852
Int. Cl.[2] B65H *69/04*
U.S. Cl. 289—18.1 **16 Claims**



1. A machine for automatically binding with a cord the end of a sausage or the like longitudinal article, comprising

means for unwinding a cord from a spool of binding cord;

a first tube axially movably and rotatably mounted in said machine and having a first projection, said cord being adapted to be looped around said first tube and first projection in a first step;

a second tube axially movably mounted in said machine relative to said first tube, said cord being adapted to be looped around said second tube in a second step;

and means operatively mounted in said machine and coacting with said cord and first and second tubes to form a clove-hitch knot around said longitudinal article when it has been positioned in axial alignment with said first and second tubes.

4,188,054

CLOSURE, PARTICULARLY FOR INDUSTRIAL FREEZER DOORS

Giuseppe La Marca, Milan, Italy, assignor to Intertecnica S.p.A., Milan, Italy

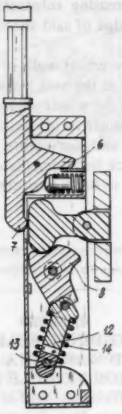
Filed Sep. 11, 1978, Ser. No. 940,951
Claims priority, application Italy, Sep. 20, 1977, 22264/73[U]
Int. Cl.[2] E05C *19/02*
U.S. Cl. 292—226 **5 Claims**

1. A closure, particularly for industrial freezer doors, comprising:

a box-like body having a top portion provided with a horizontal top clearance surface, and a lower portion, there being provided in the lower portion a suitably shaped "nose" element pivoted to the side walls of said box-like body, said nose being articulated by means of a plate to a spring guide element incorporating a spring, said guide element resting as an articulation on suitable notches provided at the bottom of the said body; and

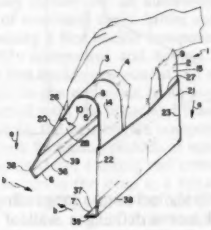
a second separable element comprising a substantially mushroom-shaped member, said second element being insertable into the said box-like body between said top closure surface and said nose element, so as to engage said nose element, and tip the nose element over center such that

said articulation provides a snap action in tipping behind said mushroom-shaped member, said mushroom-shaped



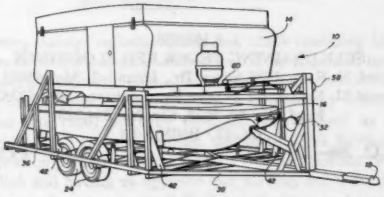
member being thereby retained within the body by means of said nose element so as to make up a secure closure.

4,188,055
DISPOSABLE SHOVEL TONGS
Martin Green, 480 McDermott Rd., Rockville Center, N.Y. 11570
Filed Sep. 22, 1978, Ser. No. 944,949
Int. Cl.[2] A47L *13/52*
U.S. Cl. 294—1 R **11 Claims**



1. Disposable manual shielding shovel tongs comprising
a self interlocking unitary firm structural planar member of stiffly bendable disposable material including
a longitudinal main panel having top and bottom surfaces, opposed substantially transversely extending longitudinal ends, opposed substantially longitudinally extending lateral sides, and insert slots therethrough longitudinally inwardly of the longitudinal ends,
a pair of opposed substantially longitudinally extending lateral panels extending substantially to the longitudinal ends of the main panel and joined to the main panel along the lateral sides of the main panel and disposed in substantially coplanar disposition on the top surface of the main panel to provide longitudinal reinforcement for the underlying portions thereat of the main panel,
a pair of opposed longitudinally spaced apart substantially transversely extending end panels extending to the lateral sides of the main panel and dimensioned to be thereby substantially transversely coextensive with the main panel and having opposed laterally outwardly facing sides and joined to the main panel along the longitudinal ends of the main panel and disposed normally in substantially coplanar disposition on the top surface of the main panel and in overlying relation over the adjacent portions thereat of the lateral panels and longitudinally inwardly terminating in spaced relation to each other to provide longitudinally opposed substantially transversely extending, normally closed and manually distendable and openable, finger insertion shielding external pockets in conjunction with the underlying marginal portions thereat of the main panel adjacent the longitudinal ends of the main panel, and
reverse locking tabs joined to the laterally outwardly facing sides of the end panels and disposed in substantially coplanar disposition on the bottom surface of the main panel longitudinally inwardly of the longitudinal ends of the main panel and arranged in interlocking relation with the insert slots therein,
whereby upon bending the member upon itself with the pockets on the resultant exterior and the bottom surface of the main panel on the resultant interior, a pair of manual shielding shovel tongs is formed having jaws corresponding to the longitudinal ends of the main panel.

4,188,056
COMBINATION BOAT AND CAMPER TRAILER
Charles L. Watson, R.R. 7, Paris, Tex. 75460
Filed Mar. 17, 1978, Ser. No. 887,714
Int. Cl.[2] B60P *3/32*
U.S. Cl. 296—157 **9 Claims**



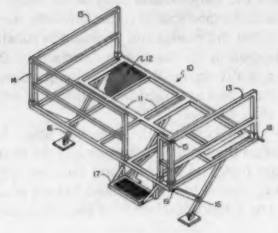
1. In a trailer for transporting and launching a boat, the improvement comprising:
structure defining a frame rigidly secured to the trailer for supporting a camper;
said frame including front and rear pairs of forwardly inclined guide members mounted on opposite sides of the trailer and supporting the camper for movement between an upper position over the boat and a lower position wherein the camper rests on the trailer in place of the boat;
said camper being positioned between said guide members and constrained for movement along said guide members;
means for selectively securing the camper to the frame in the upper position on said guide members; and
camper winch means connected between the camper and the frame for selectively effecting movement of the camper along the guide members between upper and lower positions.

4,188,057
RETRACTABLE PATIO ASSEMBLY FOR RECREATIONAL VEHICLE
Harry P. Pauli, P.O. Box 143, Burns, Wyo. 82053
Filed Jun. 28, 1978, Ser. No. 928,969
Int. Cl.[2] B60P *3/30*
U.S. Cl. 296—162 **10 Claims**

1. A retractable patio assembly for use with a recreational-type vehicle and movable from a use position adjacent a door of said vehicle to a stowed position to the side of said door comprising:
mounting means attachable to a structural member of said vehicle;

platform means pivotally connected to said mounting means, said platform means being laterally movable from a substantially horizontal use position in front of and below the vehicle door to a substantially vertical retracted position alongside the vehicle door; and

a plurality of individually adjustable, ground engaging platform support means, each of said support means providing



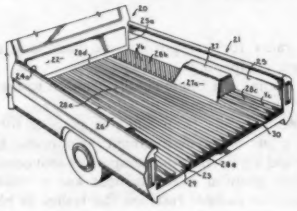
at least two points of support to said platform and comprising three arm members arranged to form a triangle, a first of said arm members pivotally connected at one end to the platform and pivotally connected at the other end to a second of said arm members at a point intermediate its ends, the third arm member being of adjustable length and disposed parallel to the platform means.

4,188,058

SELF DRAINING TRUCK BED FLOORINGS

Richard N. Resa, 3220 Susan Dr., Hannibal, Mo. 63401, and David M. Kuntzi, #1 Skyline Dr., Louisiana, Mo. 63353

Filed Apr. 10, 1978, Ser. No. 894,725
Int. Cl.[2] B60N *3/04*
U.S. Cl. 296—208 **8 Claims**



1. An insert flooring for a substantially rectangular truck bed whose area and boundaries are defined by a normally substantially horizontal rectangular bottom wall, a normally substantially vertical rectangular front wall and two normally substantially vertical rectangular side walls,

said side walls meeting at their front ends at substantial right angles with the side edges of the front wall and the side and front walls meeting the bottom wall at their lower edges,

there being at least one wheel well on each side of the truck bed intermediate the front and rear ends thereof, comprising

a substantially rectangular sheet of rigid, strong, water resistant material substantially overlying the entire bottom wall of the truck bed substantially abutting the front wall thereof with the front edge thereof and the side walls thereof with the side edges thereof with cut out portions therein for the said wheel wells

said sheet corrugated centrally between the wheel wells longitudinally substantially the entire length thereof from front to rear and wheel well to wheel well,

the crests of said corrugations paralleling one another and normally horizontal so as to normally parallel the truck bed bottom wall surface,

the valleys of said corrugations substantially paralleling one another and increasing substantially uniformly in depth from the front edge of said sheet to the rear edge of said sheet,

the areas behind the wheel wells of said sheet corrugated in the same manner as the area between the wheel wells and

the areas in front of the wheel wells of said sheet each corrugated in such manner as to pass liquid in the corrugation valleys centrally and rearwardly of said truck bed,

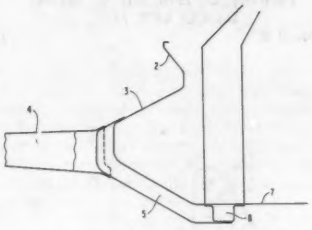
the areas of the truck bed immediately inboard of the wheel wells from front to back comprising corrugation valleys.

4,188,059

FORWARD LONGITUDINAL BEARER SUPPORTED AT THE VEHICLE END WALL OF A SELF-SUPPORTING MOTOR VEHICLE BODY

Wilhelm Bauer; Kurt Heinrich, both of Sindelfingen; Wolfgang Klie, Korntal; Wolfgang Rau, Renningen, and Werner Trost, Raidwangen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 2, 1978, Ser. No. 911,929
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1977, 2725085
Int. Cl.[3] B62D *21/00*
U.S. Cl. 296—188 **11 Claims**



1. A motor vehicle body including a longitudinal bearer and comprising end wall means defining a wall of a passenger compartment and locally bulged out in the direction of the respective vehicle end in a manner forming a rigid body, said longitudinal bearer having an end supported against said end wall and being forked so as to create a pair of arms partially surrounding said rigid body and extending to a subfloor forming means.

4,188,060

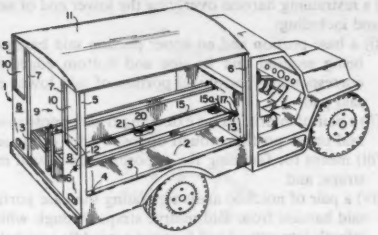
COMBAT AND TRANSPORT VEHICLE BODY

Eduardo V. Alcanzare, Angeles City, Philippines

Filed Sep. 15, 1978, Ser. No. 942,480
Claims priority, application Philippines, May 25, 1978, 21192
Int. Cl.[2] B60N *1/00*
U.S. Cl. 296—63 **3 Claims**

1. A vehicle body having a floor, vertical outer rear posts and front posts which are aligned along the longitudinal sides of said floor, rear inner rear posts spaced inwardly of said rear outer posts, a front transverse wall connected to said front

posts, a pair of longitudinal seat frames, each pivotally connected to a corresponding rear inner post and to said front



wall, and a corresponding longitudinal side wall hingedly connected to the longitudinal side of said seat frame.

4,188,061

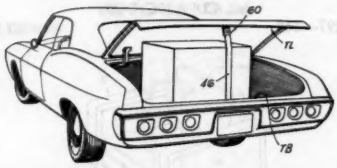
AUTOMOBILE TRUNK LID HOLDER

Lyle E. Shehi, 19 Ontario Dr., Chattanooga, Tenn. 37415

Filed Mar. 7, 1978, Ser. No. 884,123

Int. Cl.[2] B62D *25/10*

U.S. Cl. 296—76 **5 Claims**



1. A holding device for an automobile trunk lid during transporting of oversized cargo in the automobile trunk, said device comprising a first buckle component, a hinge carrying the first buckle component and having one leaf thereof attached to the first buckle component and a second leaf adapted for attachment to the underside of an automobile trunk lid, a spring connected with the hinge and biasing the first leaf in a direction holding the first buckle component against the interior of the trunk lid during periods of non-use of the device, a trunk lid holding strap, a spring reel connected with the strap and tending to reel in the strap to a retracted position, means for attaching the spring reel to the bed of an automobile trunk in opposing relation to said first buckle component, and a second buckle component carried by the free end of said strap and engageable lockingly and releasably with the first buckle component when the strap is extended from the spring reel, and pawl and ratchet means connected with the spring reel and being normally active to allow free strap rewinding movement of the spring reel while positively locking the spring reel against strap unwinding movement and including release means allowing such strap unwinding movement.

4,188,062

HANDLE-OPERATED WALL-AVOIDING RECLINER CHAIR WITH HEADREST

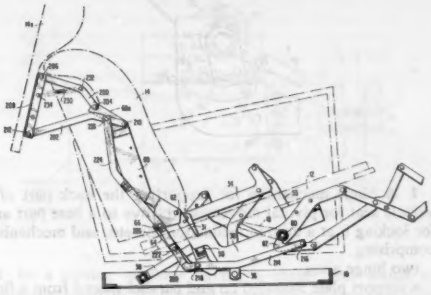
Walter C. Rogers, Jr., Denton, and David S. Hoffman, High Point, both of N.C., assignors to Royal Development Company, Inc., High Point, N.C.

Filed Jul. 10, 1978, Ser. No. 923,389

Int. Cl.[2] A47C *1/037, 7/36*

U.S. Cl. 297—61 **2 Claims**

1. In a wall-avoiding recliner chair including a primary support structure, a seat and backrest mounted relative to the primary support structure for movement between normal and reclining positions with the seat and backrest being movable forwardly relative to the primary support structure when moving to reclining position, a backrest linkage mounting the backrest for movement relative to the seat, a footrest movable between an extended position projected forwardly from the chair and a retracted position adjacent the front of the chair, and a handle-operated actuating means for driving the footrest between the extended and retracted positions thereof; a headrest (**14*a***), a headrest mounting linkage (**200, 202**) mounting the headrest to the backrest for movement between a normal position behind the backrest and an extended position projected above the backrest, and a headrest actuating linkage (**214, 220, 224**) connected to said handle-operated actuating means for moving the headrest to the extended position when the footrest is moved to the extended position, said headrest



actuating linkage includes a first link (**214**) extending in the generally forward-rearward direction of the chair and having a forward end portion connected to said handle-operated actuating means to be driven generally longitudinally thereof, a second link (**220**) pivotally mounted intermediate its ends relative to said backrest linkage, said second link having one end portion pivotally connected to a rear end portion of said first link and having an opposite end portion, and a third link (**224**) extending in a generally vertical direction and having a lower end portion pivotally connected to said opposite end portion of said second link (**220**) and an upper end portion pivotally connected to said headrest mounting linkage for driving the same between said normal and extended positions in response to said handle-operated actuating means.

4,188,063

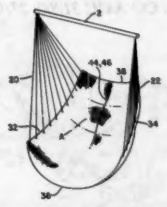
HAMMOCK CHAIR WITH BACK SUPPORTING MEANS

Etienne R. Dusart, 4C Continental Villa, Carolina, P.R.

Filed Nov. 9, 1978, Ser. No. 959,085

Int. Cl.[2] A47D *13/10*

U.S. Cl. 297—273 **6 Claims**

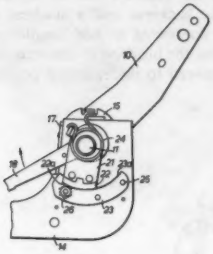


1. A suspendable hammock chair for supporting a seated person, comprising a seat part having a part adapted to engage the back of the user, and means forming in the back engaging part a ridge projecting inwardly and extending transversely of the chair at the area of the seat part engaged by the small of the back of the user.

4,188,064
VEHICLE SEAT HINGE MECHANISM

Ernest L. Cheshire, Hartwell, England, assignor to UOP Inc., Des Plaines, Ill.

Filed May 12, 1978, Ser. No. 905,482
Claims priority, application United Kingdom, May 20, 1977, 21425/77
Int. Cl.[2] A47C 1/025, 1/026
U.S. Cl. 297—367 4 Claims



1. A hinge mechanism for supporting the back part of a vehicle seat for pivotal movement relative to a base part and for locking it at a desired inclination thereto, said mechanism comprising

two hinge arms,

a support plate mounted on and parallel spaced from a first one of said hinge arms,

a shaft rigidly secured to the second of said hinge arms,

a rotational supporting device journalled in apertures in the first hinge arm and in said support plate respectively,

the shaft extending through and journalled within eccentric apertures in said supporting device,

an operating member connected to said supporting device for rotating said device relative to both said hinge arms thereby to displace the axis of said shaft laterally,

a radial arm rigidly secured to said shaft,

a first set of teeth on the radially outer end of said radial arm,

a second set of teeth fixed relative to said first hinge arm adjacent the first set of teeth,

said first set of teeth being disposed along an arc centered on the axis of said rotational supporting device, said sets of teeth being capable of meshing engagement with each other over a predetermined arc of relative movement of the two hinge arms.

4,188,065
COMBINATION HARNESS AND COVERLET FOR INFANT SEATS

Marlene F. Meeker, 804 Meade Dr., Greensboro, N.C. 27410

Filed Jul. 31, 1978, Ser. No. 929,451
Int. Cl.[2] A47C 31/00, 27/00
U.S. Cl. 297—485 3 Claims

1. An accessory for existing infant seats of the type having a back portion, a seat portion, and a skirt portion, said accessory comprising a single unit construction including:

(a) a pad having upper and lower ends and overall dimensions such that said upper end substantially overlies the back portion, and said lower end substantially overlies said skirt portion of the infant seat;

(b) a restraining harness overlying the lower end of said pad and including:

(i) a base portion and an upper portion said base portion being secured and its side and bottom edges to the corresponding peripheral portion of said lower end of said pad;

(ii) a pair of midriff straps extending from opposite sides of said upper portion around opposite sides of the seat;

(iii) means for fastening the opposite ends of said midriff straps; and

(iv) a pair of notched areas separating the base portion of said harness from said midriff straps through which an infant's legs extend and forming a straddle area between said notched areas and joining the upper portion and base portion;

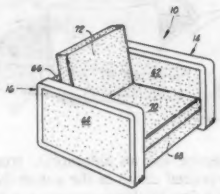
(c) at least one coverlet attached to the lower end of said pad and harness assembly of subparagraphs (a) and (b); and

(d) means for removably attaching said pad to said infant seat.

4,188,066
FURNITURE CONSTRUCTION

Amerigo Terenzoni, 5721 N.W. 19th, Oklahoma City, Okla. 73127

Filed Sep. 14, 1978, Ser. No. 942,367
Int. Cl.[2] A47C 7/00
U.S. Cl. 297—440 21 Claims



1. An improved furniture construction, comprising:

a frame, having a planar cavity therein, said cavity including an outer periphery substantially defined by said frame; and

an upholstery panel having a peripheral edge engaging said frame about the outer periphery of said planar cavity, and having a shape defined by said cavity and being dimensioned so that said panel may be press fit into said cavity and retained therein by the frictional force of said press fit.

4,188,067
KNOCK-DOWN CHAIR

Steven A. Elmer, 8506 Owensmouth Ave., Canoga Park, Calif. 91304

Filed Jul. 14, 1978, Ser. No. 924,781
Int. Cl.[2] A47C 4/00
U.S. Cl. 297—442 3 Claims

1. A chair of knock-down construction, comprising:

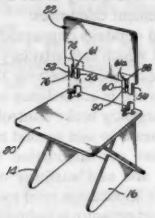
two legs, each including an upright corner portion;

a back in locked engagement with each of said legs, said back including two lower corner portions each formed with a slotted projection;

a seat in locked engagement with each of said legs and with said back, said seat including two rear corner portions;

said locked engagement being accomplished by wall structure defined by said corner portions comprising mutually engaging slots through the rear surface of each rear corner portion of said seat and the forward surface of each upright corner portion of said legs, a hole through each rear seat corner portion intersecting the slot thereat for receiving respective back lower corner projections, the

slots through the bottom surface of each lower corner projection of said back and each upright corner portion of said legs being mutually engaging when said projections



are received in said rear seat corner holes, each projection engaging the upright corner portions of each leg on opposite surfaces thereof.

4,188,068

APPARATUS FOR MIXING GAS AND LIQUID AT A DOWNHOLE LOCATION

Billy G. Holmes, Lancaster, and Jimmie Crofford, Arlington, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 17, 1978, Ser. No. 896,829
Int. Cl.[2] E21B *23/28*
U.S. Cl. 299—5 **5 Claims**

1. In combination with a well, an apparatus for mixing a gas and a liquid at a downhole location within said well, said apparatus comprising:

a conduit extending from the surface into said well and adapted to be connected at its upper end to a supply of said gas;

a mixing means affixed to the lower end of said conduit whereby said mixing means can be lowered into or raised from said well by said conduit, said mixing means comprising:

a plate having a diameter slightly less than the diameter of said well;

said plate having a central opening therethrough in which said lower end of said conduit is affixed, said conduit terminating at said plate;

said plate having a plurality of additional openings therethrough surrounding said central opening, said liquid flowing through said additional openings when said liquid is flowed down said well through the annulus formed between said conduit and the wall of said well; and

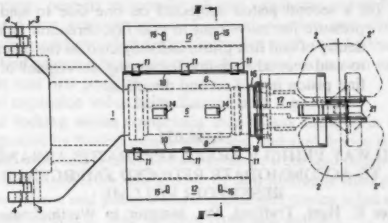
means on said plate for forming a seal between said plate and the wall of said well when said mixing means is in an operable position within said well.

4,188,069

MINING MACHINE HAVING WALK-ON PLATFORM ON CUTTER ARM

Arnulf Kissich, and Florian Süssenbacher, both of Zeltweg, Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Vienna, Austria

Filed Apr. 11, 1978, Ser. No. 895,503
Claims priority, application Austria, Apr. 28, 1977, 3028/77
Int. Cl.[2] E21C *35/00*
U.S. Cl. 299—73 **4 Claims**



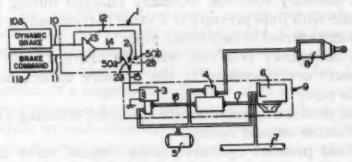
1. In a cutting machine having a cutter arm which is mounted at one end for universal pivotal movement and which carries at its free end a cutting tool: a walk-on platform covering at least part of the cutter arm, said platform being box-shaped in cross-section and having a width greater than the width of the cutter arm so as to protrude beyond the sides of the cutter arm and said platform having a generally planar top wall and a bottom wall which conforms to and rests on the exterior surface of the cutter arm; and at least one walk-on plate hinged to the platform at a side edge thereof for swinging movement about an axis which is approximately parallel to the axis of the cutter arm, said plate having a width less than the width of the top wall of the platform movable from a position in which it lies on the top wall of the platform to an extended position in which it is approximately co-planar with the top wall of the platform.

4,188,070

BRAKING COORDINATION DEVICE

Michel Grenier, Dampmart, France, assignor to WABCO Westinghouse, Freinville-Sevran, France

Filed Apr. 24, 1978, Ser. No. 899,446
Int. Cl.[2] B60T *13/74*
U.S. Cl. 303—3 **10 Claims**



1. In a rail car brake control system having a dynamic brake, a supplemental brake, an electric control circuit providing an error output signal according to the difference between a brake command signal and a dynamic brake signal representing the effectiveness of the dynamic brake, which is under control of the brake command signal, an electro-pneumatic valve device operatively responsive to the error output signal to provide a first control pressure, a main brake control pipe, a pneumatic

brake distributor valve operatively responsive to variations of pressure in the main brake control pipe to provide a second control pressure, a reservoir and a brake cylinder device, there is provided a brake blending relay valve device comprising:

(a) a pressure regulator for controlling the supply of fluid pressure from the reservoir to the brake cylinder and the exhaust of the brake pressure; and

(b) a piston assembly engageable with said pressure regulator for effecting operation thereof, said piston assembly comprising:

(i) a first piston subjected on one side to the brake cylinder pressure for urging said piston assembly in a first direction and subjected on the other side to the first control pressure for urging said piston assembly in a direction opposite said first direction,

wherein the improvement comprises:

(ii) a second piston subjected on one side to said first pressure for movement in said first direction independently of said first piston and subjected on the other side to said second pressure for urging movement of said first piston in said second direction.

4,188,071

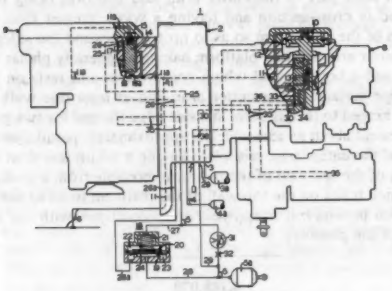
RAILWAY VEHICLE BRAKE APPARATUS ARRANGED TO ACCOMMODATE REDUCED EMERGENCY RESERVOIR VOLUME

James E. Hart, Trafford, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Jun. 19, 1978, Ser. No. 916,999

Int. Cl.[2] B60T *15/22*

U.S. Cl. 303—33 **5 Claims**



1. A fluid pressure controlled railway vehicle brake apparatus comprising:

(a) a brake pipe in which the variation of fluid pressure is effective to initiate brake application and release control of the brakes on said vehicle;

(b) an auxiliary reservoir normally charged during brake release with fluid pressure at a value corresponding to the pressure carried in said brake pipe;

(c) an emergency reservoir normally charged with fluid pressure corresponding to the pressure carried in said brake pipe;

(d) fluid pressure operative brake means for effecting a brake application on said vehicle;

(e) a fluid pressure operative brake control valve device comprising:

(i) service brake control means for establishing fluid pressure communication between said auxiliary reservoir and said brake means in response to a reduction of fluid pressure in said brake pipe to provide a service brake application and for establishing fluid pressure communication between said brake means and atmosphere in response to an increase of fluid pressure in said brake pipe to provide said brake release; and

(ii) emergency brake control means for establishing fluid pressure communication between said emergency reservoir and said brake means when said reduction of said brake pipe fluid pressure occurs at a predetermined rate to provide an emergency brake application;

wherein the improvement comprises:

(f) first and second conduits connected in parallel with said brake means via which said auxiliary reservoir fluid pressure and said emergency reservoir fluid pressure is conducted, respectively, in accordance with operation of said service and emergency brake control means;

(g) cut-off valve means in said second conduit for interrupting fluid pressure communication between said emergency reservoir and said auxiliary reservoir during said emergency brake application until such time as said auxiliary reservoir fluid pressure is reduced to a predetermined value; and

(h) a one-way check valve device in said first conduit preventing the flow of said emergency reservoir fluid pressure from said second conduit to said auxiliary reservoir via said first conduit.

4,188,072

BRAKE ACCELERATOR DEVICE FOR AN AIR BRAKE SYSTEM OF A RAILWAY VEHICLE

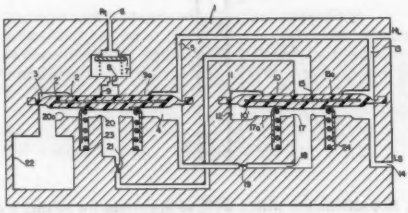
Josef Hintner, and Georg Stäuble, both of Munich, Fed. Rep. of Germany, assignors to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

Filed Jun. 12, 1978, Ser. No. 914,754

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1977, 2727762

Int. Cl.[2] B60T *15/32*

U.S. Cl. 303—69 **7 Claims**

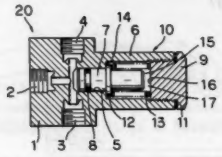


1. A brake accelerator for an air brake system of a railway vehicle and comprising a first piston having one side subjected to air pressure in a brake line and a second side subjected to air pressure in an auxiliary reservoir, a first passage connected from an emergency reservoir and opening to said one side of said first piston, means defining an inlet valve in said first passage actuated by said first piston, a second piston having one side subjected to air pressure in a brake line and a second side subjected to air pressure in an auxiliary reservoir, means defining a first chamber on said second side of said first piston, means defining a second chamber at said second side of said second piston, a second passage including said second chamber connecting said first chamber to the auxiliary reservoir when the pressure in the brake line is less than or equal to the pressure in the auxiliary reservoir, and means for closing said second passage when the air pressure in said brake line reaches a predetermined value higher than the brake pressure in the auxiliary reservoir.

4,188,073
ANTI-VIBRATION APPARATUS FOR A VEHICLE BRAKE SYSTEM

Masakazu Ishikawa; Juichi Shibatani, and Sadayoshi Ito, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jul. 5, 1978, Ser. No. 922,237
Claims priority, application Japan, Jan. 19, 1978, 53-4996
Int. Cl.² B60T *17/04*
U.S. Cl. 303—87 **3 Claims**



1. An anti-vibration means for an automotive hydraulic disc brake comprising:

a cylinder portion formed in communication with a hydraulic braking fluid circuit;

a plunger slidably and fluid-tightly fitted in said cylinder portion, one end of said plunger being under the pressure of said hydraulic braking fluid and the other end of said plunger facing an air chamber;

restricting means for restricting the axial sliding of said plunger within a limited range; and

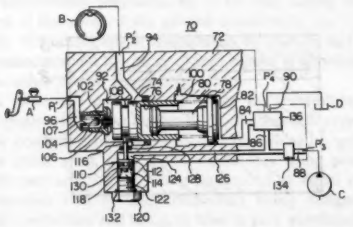
spring means for constantly biasing said plunger in a direction to resist the braking fluid pressure,

wherein said cylinder portion is accommodated in a cup-shaped piston and integrally formed on the bottom wall of said piston, said piston being slidably fitted in a wheel cylinder of a disc brake, and the resilient force of said spring means is determined smaller than the force acting on said plunger through said braking fluid pressure in the high pressure range wherein no brake vibration occurs.

4,188,074
HYDRAULIC ANTI-SKID DEVICE

Toshio Yama, and Kazuaki Shimizu, both of Fujisawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 22, 1977, Ser. No. 826,671
Claims priority, application Japan, Aug. 23, 1976, 51-100372
Int. Cl.² B60T *17/18*
U.S. Cl. 303—92 **2 Claims**



1. A hydraulic anti-skid device for a hydraulic braking system, comprising

a pump for feeding a hydraulic fluid pressure into said anti-skid device,

first passage means for receiving a braking pressure,

second passage means communicable with said first passage means for allowing the braking pressure to be discharged from said anti-skid device,

an expansion valve operably disposed for controlling communication between said first and second passage means,

said expansion valve having a first position in which it provides said communication and a second position in which it obstructs said communication and reduces the braking pressure in said second passage means,

third means for causing said expansion valve to assume said first position when it is unnecessary to reduce the braking pressure in said second passage means and for causing said expansion valve to assume said second position when it is necessary to reduce the braking pressure in said second passage means, locking means which, when said anti-skid device is fed with said hydraulic fluid pressure from said pump, permits movement of said expansion valve from said first position into said second position and which, when said anti-skid device is not fed with said hydraulic fluid pressure from said pump, locks said expansion valve in said first position,

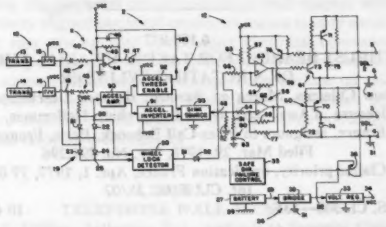
said expansion valve being formed with a groove,

said locking means comprising stop means engaged in said groove by biasing means when said anti-skid device is not fed with said hydraulic fluid pressure from said pump and disengaged from said groove by said hydraulic fluid pressure from said pump when said anti-skid device is fed with said hydraulic fluid pressure from said pump.

4,188,075
ADAPTIVE ACCELERATION SYSTEM FOR VEHICLE SKID CONTROL SYSTEMS

Yudh V. Rajput, Dayton, Ohio, and Gary J. Skodack, Novi, Mich., assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Jun. 16, 1978, Ser. No. 916,311
Int. Cl.² B60T *8/02*
U.S. Cl. 303—106 **6 Claims**



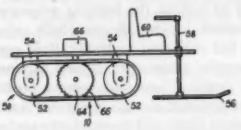
1. An anti-skid brake control system for automatically overriding manual control of a vehicle brake system in response to changes in vehicle wheel speed indicative of a skid condition or the like, comprising transducer means for producing an electrical signal representative of the speed of at least on vehicle wheel, detector means responsive to changes in such wheel speed as represented by such electrical signal for detecting deceleration of a magnitude indicative of an actual or incipient skid, control means for overriding such vehicle brake system in proportion to such detected deceleration, acceleration detector means for responding to acceleration of such vehicle wheel to produce an acceleration signal representative of such acceleration, and output means for controlling such control means to effect such overriding in inverse relation to the magnitude of such detected acceleration and further comprising enabling means for enabling said output means to effect such controlling when such vehicle wheel acceleration exceeds a predetermined threshold and until after such acceleration has begun decreasing, and wherein said output means includes means for disabling said detector means when enabling said output means.

4,188,076

ENDLESS BELT AND ROLL ASSEMBLY FOR VEHICLES OR CONVEYERS

Jorma Pohjola, Haravatie 6, 90530 Oulu 53, Finland

Filed Jun. 23, 1977, Ser. No. 809,453
Claims priority, application Finland, Jun. 24, 1976, 761865
The portion of the term of this patent subsequent to Oct. 10, 1995, has been disclaimed.
Int. Cl.² B65D 55/24
U.S. Cl. 305—29 9 Claims



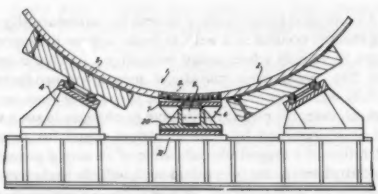
1. In a structure such as a vehicle or conveyer, a pair of roll means which are spaced from each other and which have central axes of rotation, respectively, situated in a given common plane and fixed with respect to each other, and endless belt means extending between and guided around said pair of roll means and having on opposite sides of said plane, respectively, a pair of runs which respectively travel in opposite directions between said roll means during rotation of the latter, said endless belt means having opposed endless side edge regions and midway between the latter an endless elongated central region which is flexible but substantially non-stretchable while between said central substantially non-stretchable region and each of said side edge regions said endless belt means has an endless lateral elastic portion capable of stretching and contracting longitudinally, each of said edge regions being in a stretched condition tending to contract upon itself when having a length approximately equal to that of said central region.

4,188,077

THRUST BEARING FOR TAKING UP AXIAL THRUST OF A ROTATING CYLINDER

Alain Chielens, Marcq en Baroeul; Bernard Deschamps, Villeneuve d'Ascq, and Gerard Marchal, Hellemmes, all of France, assignors to Fives-Cail Babcock, Paris, France

Filed Mar. 29, 1978, Ser. No. 891,296
Claims priority, application France, Apr. 1, 1977, 77 09879
Int. Cl.² F16C 25/02
U.S. Cl. 308—135 10 Claims



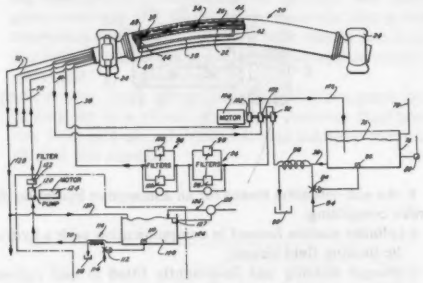
1. A thrust bearing device for taking up axial thrust of a cylindrical element of large radius rotating about an axis, the cylindrical element comprising a ring and bearings supporting the ring for rotation of the cylindrical element, which device comprises a support, a stationary stand, the support being mounted on the stand for pivoting about an axis extending radially with respect to the cylindrical element, the cylindrical element having at least one plane face, and bearing means mounted on the pivotal support in a gliding relationship along each plane face of the cylindrical element, the bearing means comprising a series of bearings arranged in an arc of a circle in gliding relationship with the plane face.

4,188,078

BEARING LUBRICATION SYSTEM FOR BOWED ROLLS

Joseph A. Bolton, Glens Falls, and William Hoover, Hudson Falls, both of N.Y., assignors to Albany International Corp., Albany, N.Y.

Filed May 25, 1978, Ser. No. 909,201
Int. Cl.² F16C 33/76
U.S. Cl. 308—187 9 Claims



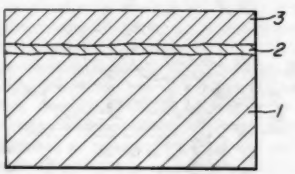
1. In a roll of the type having an elongated shaft, a plurality of spools dispersed about said shaft for rotation and a plurality of ball bearings disposed along said shaft, each of said bearings having an inner race in contact with said shaft, an outer race in contact with one of said spools and a through passageway between said races and cooperating with said races in defining a ball chamber, the improvement comprising; a recirculatory lubricant system for providing lubricant to the interior of said ball chambers including a lubricant reservoir, a lubricant line extending between said reservoir and the interior of the roll so that lubricant may be interjected to the interior of the roll at a predetermined location, and means for directing the lubricant interjected from the line into communication with the ball chambers in a desired pattern.

4,188,079

MULTIPLE-LAYER METAL BEARING FOR USE IN A LARGE-SIZE ENGINE

Sanae Mori, Nagoya, Japan, assignor to Daido Metal Company Ltd., Nagoya, Japan

Filed Feb. 22, 1978, Ser. No. 879,973
Claims priority, application Japan, Aug. 22, 1977, 52/100277
Int. Cl.² F16C 33/06, 9/02
U.S. Cl. 308—237 R 4 Claims



1. A multi-layer metal bearing for use in a large-size engine having three layers consisting of a steel backing layer, a bonding layer of aluminum or aluminum alloy, and a bearing alloy layer, the improvement wherein said bearing alloy layer has the compositions of more than 50% up to 65% by weight tin, more than 0.5% up to 1.5% by weight copper, and the remainder essentially of aluminum, and said bearing alloy exhibits

high temperature hardnesses at 100° C. or higher that varies continuously within the following range, i.e.;

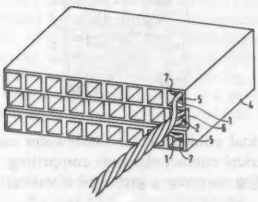
At 100° C.—18 to 29 Hv
At 150° C.—14 to 24 Hv
At 200° C.—9 to 19 Hv.

4,188,080

CABLE FOR TRANSMITTING LOW-LEVEL SIGNALS

Bernd Streble, Friedberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 2, 1978, Ser. No. 882,855
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1977, 2711531
Int. Cl.[2] H01B *11/04*
U.S. Cl. 339—14 R **7 Claims**



1. A signal transmitting system for transmitting two signals by cable with reduced cross-talk wherein the cable comprises:

a cable formed of four conductors arranged together in a spiral quad, two of said conductors being positioned opposite to one another, said two of said conductors being signal conductors, the other two of said conductors being ground conductors, wherein the ground conductors are bare and the signal conductors are individually insulated and wherein the winding of the spiral quad is such that a line joining the center of the cores of the signal conductors is substantially perpendicular to the line joining the centers of the cores of the ground conductors, and wherein one of said signals is transmitted by one of said signal conductors and the other of said signals is transmitted by the other of said signal conductors.

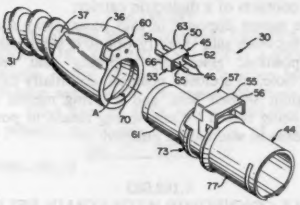
6. A cable and connector assembly for transmitting low-level signals with a low degree of close cross-talk comprising a cable consisting of four conductors combined together to form a spiral quad, two of the conductors being positioned opposite one another and being designated as signal conductors, another two of said conductors being designated as ground conductors and being, at least in part, positioned intermediate the signal conductors, the signal conductors being individually insulated and the ground conductors being bare, the conductors being connected to a connection element, the connection element comprising a three-row plug, a central row of the plug forming a ground row, the ground connectors being attached to the ground row, outer rows of the plug forming signal rows, and one of the signal conductors being each attached to one of the signal rows.

4,188,081

VACUUM CLEANER HOSE ASSEMBLY AND METHOD OF MAKING SAME

Homer N. Holden, Sylva, and Ivan Gaster, Hazelwood, both of N.C., assignors to Dayco Corporation, Dayton, Ohio

Filed Jun. 5, 1978, Ser. No. 912,906
Int. Cl.[2] H01R *3/04*
U.S. Cl. 339—15 **28 Claims**



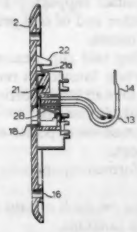
1. In a vacuum cleaner hose assembly comprising; an elongated vacuum hose having a hose end and a central longitudinal axis; a plurality of electrical conductors extending along said vacuum hose with each conductor having an end portion disposed immediately adjacent said hose end; a plurality of electrical connectors each fixed to an associated end portion of an associated conductor, and a flexible hose fitting fixed to said hose end and formed substantially as an integral part thereof with said fitting having a plurality of said electrical connectors embedded therein which are movable with flexing movements of said fitting; the improvement comprising; a rigid hose adapter operatively connected to said fitting, an electrical device carried by said adapter and connected to said embedded connectors, said device having precisely aligned integral electrical connector means, said device comprising a rigid support structure made of an electrical insulating material, and means positioning the electrical device relative to said adapter with said precisely aligned electrical connector means readily accessible for easy mating with cooperating electrical connector means, said positioning means comprising a positioning surface on said support structure and a cooperating surface on said adapter, said surfaces being self-aligning surfaces which self align upon connecting said adapter and electrical device to said fitting and embedded connectors.

4,188,082

TELEPHONE WALL JACK

Donald F. Dickey, Arlington, Tex., assignor to Superior Cable Corporation, Hickory, N.C.

Filed Feb. 15, 1979, Ser. No. 12,503
Int. Cl.[2] H01R *13/44*
U.S. Cl. 339—36 **9 Claims**



1. A telephone wall jack comprising:

(a) a base plate having at least one rectangular shaped hole therein;

(b) a jack housing circumscribing said hole on three sides composed of two directly opposing sidewalls integrally connected one to another by a third sidewall, all of said sidewalls extending perpendicular from and integrally connected to said base plate, said two directly opposing sidewalls forming a passageway in communication with said rectangular shaped hole and are connected by a top disposed parallel to and spaced apart from said base plate, said top having at least one free edge, said free edge containing a plurality of parallel slots adapted to receive spring contacts of a dielectric carrier;

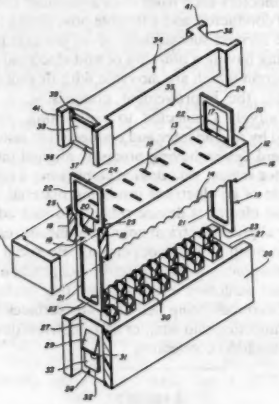
(c) a gate means disposed in said passageway slidably engaged between said directly opposed sidewalls from an open position, essentially exposing said rectangular shaped hole, to a closed position, essentially closing said rectangular shaped hole, and a spring means, said gate means being biased by said spring means to position the gate means in said closed position.

4,188,083

FLAT CABLE CONNECTOR WITH STRAIN RELIEF AND TWO-POSITION LATCH

Robert G. Knowles, Litchfield, Conn., assignor to Litton Systems, Inc., Oakville, Conn.

Filed Jun. 1, 1978, Ser. No. 911,213
Int. Cl.[2] H01R *13/38*
U.S. Cl. 339—99 R **5 Claims**



1. In a connector for terminating flat multi-conductor cables including a lower contact support in which is mounted a plurality of insulation displacement contacts, a pressure member having a pair of end walls on opposite ends thereof, and a strain relief, the combination comprising:

clip means for transmitting stress from said strain relief to said lower contact support,

slot means at either end of said pressure member for receiving said clip means,

means for holding said clip means in said slot means,

a first latch portion formed on one end of each of said clip means and a second latch portion formed on another end of each of said clip means,

first detents formed on opposite end surfaces of said lower contact support,

second detents formed on opposite end surfaces of said strain relief,

first catch means on each of said first detents for engaging said first latch portions,

second catch means on each of said first detents for engaging said first latch portions,

third catch means on each of said second detents for engaging said second latch portions, and

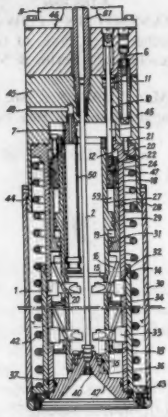
support surfaces between said first catch means and said second catch means for supporting said first latch portions.

4,188,084

UNDERWATER ELECTRICAL CONNECTORS

Georges Burési, Versailles, and Rene G. Grappé, Paris, both of France, assignors to Compagnie Francaise des Petroles, Paris, France

Filed Nov. 17, 1978, Ser. No. 961,829
Claims priority, application France, Nov. 21, 1977, 77 34855
Int. Cl.[2] H01R *3/04*
U.S. Cl. 339—117 R **19 Claims**



1. An electrical connector for underwater connection of groups of electrical contact elements comprising:

a movable plug carrying a group of electrical contact elements;

a base carrying a group of electrical contact elements to be connected to the elements of said plug;

an enclosure in each of said plug and base filled with insulating liquid in which the respective said electrical contact elements are immersed, one of said enclosures being annular and the other of said enclosures being cylindrical;

an inner protective body inwardly limiting said annular enclosure; and

an outer protective body outwardly limiting said cylindrical enclosure,

wherein said cylindrical enclosure is adapted to slide relatively over the surface of said annular enclosure so as to replace said inner protective body from said cylindrical enclosure and to place corresponding ones of said electrical contacts opposite one another.

4,188,085

HIGH DENSITY SOLDER TAIL CONNECTOR ASSEMBLY FOR LEADLESS INTEGRATED CIRCUIT PACKAGES

Lionel D. Aldridge, Seminole, Fla., and George J. Sprenkle, Phoenixville, Pa., assignors to Burroughs Corporation, Detroit, Mich.

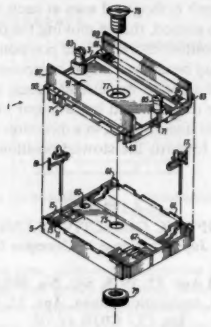
Filed Sep. 27, 1978, Ser. No. 946,279
Int. Cl.[2] H05K *1/10*
U.S. Cl. 339—176 MP **17 Claims**

1. A connector assembly for leadless integrated circuit packages comprising:

(a) a plurality of complementary pairs of unitary metallic contacts, each of said contacts comprising:

(i) an elongated S-shaped spring-beam portion;

(ii) a contacting portion formed on an upper part of said spring-beam portion;
(iii) a preloading tab formed on said upper part of said spring-beam adjacent said contacting area;
(iv) a substantially flat base portion connected to a lower part of said spring-beam portion;
(v) a dog-leg portion formed on said base portion; and
(iv) a downwardly extending tail portion formed on said dog-leg portion, said complementary pairs of contacts



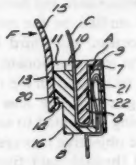
differing solely in the location of said dog-leg portion formed on said base portion; and
(b) upper and lower dielectric headers each having a plurality of contact receiving cavities formed therein, said cavities separated by a plurality of intermeshing walls, each said cavity of said lower header including channel means for receiving said contact, and each said cavity of said upper header including contact receiving means and preloading means to bias said contact in a preloaded position when said upper header is fitted over said lower header.

4,188,086

CONNECTOR FOR TERMINATING FLEXIBLE PARALLEL CONDUCTORS

Hiromasa Inouye, Musashino; Tomonari Ohtsuki, Itabashi, and Yoshiaki Igarashi, Ichikawa, all of Japan, assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Jun. 12, 1978, Ser. No. 914,196
Claims priority, application Japan, Jun. 13, 1977, 52/075911[U]
Int. Cl.[2] H01R *13/54;* H05K *1/12*
U.S. Cl. 339—176 MF **4 Claims**



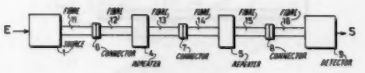
1. A connector for terminating flexible parallel conductors, comprising:
a male part having a length of distal surface about which an end of a flexible group of parallel conductors is bent, said male part including a base portion and an elongate projection projecting perpendicularly from said base, the end of said elongate projection defining said length of distal surface;
a female part having a closed slot therein and a plurality of contacts along at least one wall of said slot, for receiving at least said length of distal surface with said end of said group of parallel conductors bent thereabout, said contacts electrically contacting respective ones of said parallel conductors; and
a plurality of recesses in said base portion of said male part spaced along said elongate projection for receiving and holding the ends of respective ones of said parallel conductors.

4,188,087

OPTICAL FIBRE POSITIONING FERRULE AND CONNECTOR COMPRISING SUCH A FERRULE

Luigi D'Auria; André Jacques, and Christian Malsot, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Apr. 10, 1978, Ser. No. 895,076
Claims priority, application France, Apr. 13, 1977, 77 11060
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.20 **7 Claims**



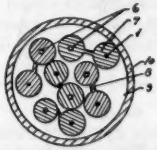
1. A positioning ferrule for an optical fibre propagating a radiation and comprising a core and a sheath, said ferrule comprising a rigid body inserting said fibre and being integral with said fibre, and photodetector means located within said body for receiving the fraction of energy travelling in said sheath.

4,188,088

OPTICAL ELEMENT FOR USE IN OPTICAL TRANSMISSION MEANS

Axel Andersen, Gentofte; Poul U. Knudsen, Hellerup, and Knud B. Jensen, Skodsborg, all of Denmark, assignors to Aktieselskabet Nordiske Kabel-OG Traadfabriker, Copenhagen, Denmark

Filed Nov. 4, 1977, Ser. No. 848,694
Claims priority, application Denmark, Nov. 9, 1976, 5053/76
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.23 **15 Claims**

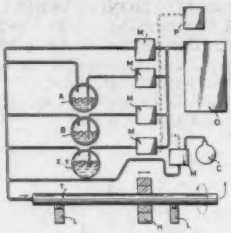


13. Optical transmission means comprising at least one optical element located in a sheath, wherein said optical element comprises at least one optical fiber which is provided with an essentially tight-fitting coating and a strength member provided with an essentially tight-fitting coating of the same material, each of said coatings having an essentially circular cross-section, the coating or coatings on the optical fibers further being firmly connected with the coating on the strength member by a connection means of the same material as the coating, and whose thickness is substantially smaller than the diameter of the coatings and where further the fiber or fibers are given a curve shaped course.

4,188,089
OPTICAL FIBERS HAVING HIGH INFRARED TRANSMITTANCY

Georg Gliemeroth, Finthen, and Lothar Meckel, Ostrich, both of Fed. Rep. of Germany, assignors to Jenaer Glaswerk Schott & Gen., Mainz, Fed. Rep. of Germany

Filed Oct. 27, 1977, Ser. No. 846,238
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1976, 2648702
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.34 12 Claims

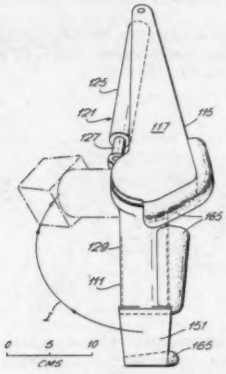


1. In an optical fiber having infrared transmittancy, and a refractive index gradient, and which is prepared by chemical vapor deposition, the improvement wherein in the vitreous, light-conducting region of the fiber, the anions are predominantly S, Se, Te or combinations thereof, and the cations are Ge, Si, P, B, Sb, Ti or combinations thereof.

4,188,090
RETRACTABLE HEAD-UP DISPLAYS

Stafford M. Ellis, East Preston, England, assignor to Elliott Brothers (London) Limited, Chelmsford, England

Filed May 26, 1978, Ser. No. 909,831
Claims priority, application United Kingdom, Jun. 1, 1977, 23101/77; Jun. 21, 1977, 25809/77; Apr. 4, 1978, 13143/78
Int. Cl.[2] G02B 27/10
U.S. Cl. 350—174 3 Claims

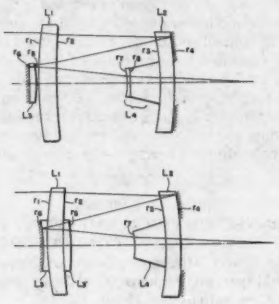


1. A display head for an aircraft head-up display system comprising an optical projector and an image combiner through which an observer can view a distant scene and from which collimated optical images developed by and projected from the optical projector are reflected to the observer wherein: the image combiner is supported from a light obstructive member which intrudes within the observer's field of view of the distant scene in use of the display head, but no intruding part of said member has a width greater than a prescribed interpupillary distance so that notwithstanding the intrusion of said member there is no obstruction by said member of the observer's view of the distant scene, the display head being rotatable about a single axis for displacement between an operational position in which the display head is at a position intercepting the observer's line-of-sight to the distant scene and a stowed position at which the display head is at a position at which it does not intrude into the observer's field of view of the distant scene, and said single axis being inclined with respect to the aircraft orthogonal axes at such an angle, and the display head is so shaped, that in moving the display head from the operational position to the stowed position the initial movement of the display head has a major component parallel to the observer's line-of-sight to the distant scene, and the terminal movement of the display head has a major component to the left or right of said line-of-sight, in a direction at right angles to said line-of-sight towards the stowed position.

4,188,091
CATA-DIOPTRIC OBJECTIVE LENS SYSTEM

Toru Fujii, Hino, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 12, 1978, Ser. No. 895,806
Claims priority, application Japan, Apr. 22, 1977, 52-46463
Int. Cl.[2] G02B 17/08
U.S. Cl. 350—201 5 Claims



1. A cata-dioptric objective lens system comprising a first, second, third and fourth lens components, said first lens component being a positive meniscus lens arranged convex toward the object side, said second lens component being arranged concave toward the object side and having a concave primary mirror formed on its surface on the image side by leaving a transparent central portion, said third lens component being arranged near said first lens component and having a secondary mirror formed on its surface on the object side, said fourth lens component being a negative lens component having a large thickness and being cemented to said second lens component, said cata-dioptric objective lens system being arranged so that the rays entered through said first lens component are reflected by said primary mirror and secondary mirror, go out through said transparent central portion of said second lens component and are imaged thereafter, said cata-dioptric objective lens system satisfying the following conditions:

(1) $1.0f \leqq f_1 \leqq 2.5f$

(2) $0.05f \leqq |r_7| \leqq 0.2f$

(3) $0.05f \leqq D_4 + D_2 \leqq 0.1f$

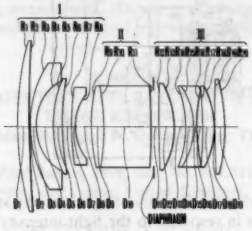
wherein reference symbol f_1 represents the focal length of the first lens component, reference symbol r_7 represents the radius of curvature of the surface on the object side of the fourth lens component, reference symbol D_2 represents the thickness of the second lens component, and reference symbol D_4 represents the thickness of the fourth lens component.

4,188,092

RETROFOCUS TYPE WIDE-ANGLE OBJECTIVE LENS

Kikuo Momiyama, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 31, 1978, Ser. No. 892,422
Claims priority, application Japan, Apr. 5, 1977, 52/38690
Int. Cl.[2] G02B 9/64
U.S. Cl. 350—214 5 Claims



1. A retrofocus type wide-angle objective lens comprising:

a divergent first lens group including in the indicated order a first positive meniscus lens having a convex face directed toward an object to be photographed, a second negative meniscus lens having a convex face directed toward the object, a third positive meniscus lens having a convex face directed toward the object and a fourth negative meniscus lens also having a convex face directed toward the object;

a convergent second lens group behind the first lens group and coaxial therewith and including a positive lens having a convex front lens face directed toward the object;

a convergent third lens group behind the second lens group and coaxial therewith and including in the indicated order a positive lens having a convex rear lens face directed toward an image of the object being photographed, a biconcave lens, a positive meniscus lens directing a convexed face to the image and a positive lens; and

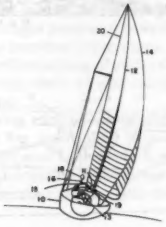
a diaphragm disposed between the second and third lens groups.

4,188,093

LARGE SAILBOAT VISIBILITY IMPROVEMENTS

Henry A. Netzer, 7441 Classic Dr., Glen Burnie, Md. 21061

Filed Mar. 30, 1978, Ser. No. 891,905
Int. Cl.[2] G02B 5/08
U.S. Cl. 350—303 1 Claim



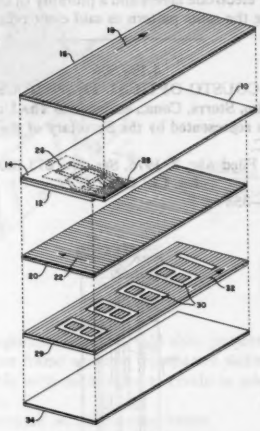
1. A pair of wide angle mirror assemblies adapted to be mounted on the bow or bowrail of a large sailboat comprising, a pair of mirror brackets for use in affixing the mirrors to the bow or bowrail of the sailboat, a pair of mirrors, means for mounting one of said mirrors so as to permit pivotal movement about a horizontal axis to each of said mounting brackets, and means attached to each said mirrors so that each mirror will always maintain the reflecting surface thereof in a vertical plane, said assemblies when attached to the bow of a large sailboat permitting the helmsman to see portions of the horizon, forward, around and behind the sails, which, in the absence of such device, would be obscured by opaque sail material.

4,188,094

LIQUID CRYSTAL DISPLAY HAVING LIGHT INDICIA ON A DARK BACKGROUND

James L. Fergason, 5806 Horning Rd., Kent, Ohio 44240

Filed Feb. 15, 1978, Ser. No. 877,923
Int. Cl.[2] G02F 1/13
U.S. Cl. 350—337 3 Claims



1. A liquid crystal display in which an image appears light on a dark background, comprising a layer of nematic liquid crystal material of positive dielectric anisotropy sandwiched between transparent parallel plates, films of transparent conductive material on selected areas of the plates and in contact with the liquid crystal material, the plates being treated to effect a twisted-nematic structure such that polarized light will be rotated through 90° in passing through the polarizer, first polarizer means on the front of said display, second polarizer means behind said display covering the entire area of the display except those selected areas defined by the transparent conductive material on one of the transparent plates, and third polarizer means adjacent said second polarizer means and crossed with respect thereto such that polarized light which passes through the transparent parallel plates in areas outside the selected areas will not pass through the second and third polarizer means.

4,188,095

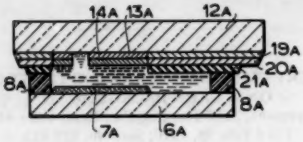
LIQUID TYPE DISPLAY CELLS AND METHOD OF MANUFACTURING THE SAME

Katsuo Nishimura, and Takanori Nanya, both of Tokorozawa, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Division of Ser. No. 709,938, Jul. 29, 1976, abandoned. This application Sep. 29, 1978, Ser. No. 947,053
Claims priority, application Japan, Jul. 29, 1975, 50-92403; Jul. 29, 1975, 50-92406; Aug. 26, 1975, 50-102590
Int. Cl.[2] B01J 17/00
U.S. Cl. 350—357 6 Claims

1. A method of manufacturing a liquid display cell of the type including electrode layers on a substrate and electrochromic layers on said electrode layers, said electrode layers and said electrochromic layers being arrange in a predetermined pattern, said method comprising the steps of forming an electrode layer on said substrate, forming an electrochromic layer

on said electrode layer, and photoetching in one step said electrode layer and said electrochromic layer thereby forming



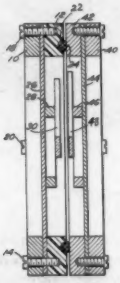
a plurality of electrode layers and a plurality of electrochromic layers having the same pattern as said electrode layers.

4,188,096

ACOUSTO-OPTICAL TRANSDUCER

Peter Shajenko, Storrs, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 2, 1976, Ser. No. 673,180
Int. Cl.[2] G02F *1/11*
U.S. Cl. 350—358 **5 Claims**



1. An acousto-optical transducer for detecting acoustic pressure wave which comprises:

a generally cylindrical housing having two generally parallel faces, said housing being air tight and water tight;

a pair of mirrors including a first mirror and a second mirror, said first mirror and said second mirror being arranged to be parallel to each other in said housing and being generally parallel to the faces of said housing;

means for free motion of said pair of mirrors under the influence of the acoustic pressure waves;

means for filling said housing with a transparent fluid;

means for allowing an incident light beam of a first frequency to fall on said first mirror in said housing and for allowing the reflected light of a second frequency after multiple reflections thereof to come out of said housing; and

means for comparing said reflected light beam of the second frequency with a light beam of a fixed frequency.

4,188,097

METHOD OF AND APPARATUS FOR TESTING VISUAL INTEGRITY

Jack T. Holladay, 8484 Ariel, Houston, Tex. 77074

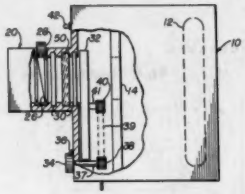
Filed Jun. 2, 1977, Ser. No. 802,648
Int. Cl.[2] A61B *3/02*
U.S. Cl. 351—36 **18 Claims**

4. Apparatus used to test the visual integrity of an individual, comprising:

a target;

a light source for illuminating the target;

a binocular viewing mechanism or providing an orthophoric view of the target to the individual with a Cyclopean axis extending through the geometric center of the target, said binocular viewing mechanism having a right eyepice for viewing substantially one-half of the target formed when bisecting the target with a sagittal plane passing through the Cyclopean axis and a left eyepiece for viewing substantially the other half of the target;



means for varying the intensity of light arriving at the right and left eyepiece in response to the light intensity perceived in each eye by the individual until the light intensity is perceived to be equal in both eyes; and

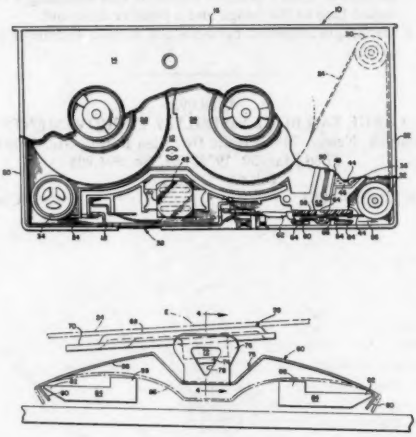
means connected to said varying means for providing a measurement of the difference between the light intensity provided at the right eyepiece and the light intensity provided at the left eyepiece as an indication of the visual integrity of the individual.

4,188,098

PHOTOGRAPHIC FILM CASSETTE HAVING BOWED SPRING WITH DEVICE PREVENTING OVERSTRESSING OF SPRING

Sheldon D. Powers, Stoneham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 4, 1979, Ser. No. 26,908
Int. Cl.[2] G03C *11/00*
U.S. Cl. 352—130 **9 Claims**



1. In a film cassette having a housing containing a strip of film, forming means for facilitating formation of a processing fluid layer on a given film surface during travel of the film therepast in a given direction, a pressure pad biased towards said forming means so as to support successive incremental portions of the film strip in a predetermined relationship to said forming means, the improvement comprising:

a deflectable, generally bowed shaped spring having end portions and an intermediate portion, said intermediate

portion engaging and biasing said pressure pad toward said forming means with a predetermined minimum biasing force to support the strip in said predetermined relationship; and

spring support means for engaging and supporting said opposite end portions, said support means having spring bearing surfaces being in spaced relationship to said intermediate portion for limiting deflection of said spring such that said spring does not become deflected to the point of becoming overstressed, thereby precluding substantially altering said predetermined minimum biasing force.

4,188,099

IMAGE PROJECTION APPARATUS WITH SUSTAINED IMAGE EXPOSURE

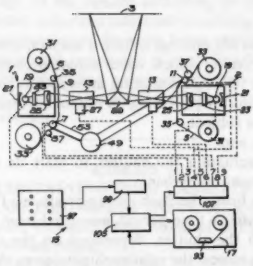
Phillip R. Hadden-Deering, 5 N. Dene, Birtley, Tyne and Wear, England

Filed Jan. 6, 1978, Ser. No. 867,411

Claims priority, application United Kingdom, Jan. 6, 1977, 280/77

Int. Cl.[2] G03B *21/32, 21/26*

U.S. Cl. 353—94 **2 Claims**



1. Apparatus for projecting plural images onto a screen area comprising in combination:

a pair of projectors, each of said projectors having an illuminating projection lamp, a zoom focusing lens and a film transport mechanism, said film transport mechanism comprising a drive connected to a film advancing sprocket by a selectively operable clutch and brake and a Geneva transmission for frame-by-frame advancing of a film for normal movie film-type drive, the Geneva transmission being selectively disconnectable from the sprocket in favor of an auxiliary drive for slowly advancing the film for scanning of a frame;

reflecting means arranged with said projectors so as to project the images produced by said projectors in coincidence onto a common screen area;

means for on/off switching of each of said projection lamps;

means for driving each of said transport mechanisms at a selected speed;

means for moving each of said zoom lenses; and

a control unit for controlling said switching means, said driving means and said zoom lens moving means, said control unit including a pre-programmed magnetic tape memory, a decoder and actuator means responsive to said decoder.

4,188,100

ROTARY SLIDE CARRIER SYSTEM

Harry W. Prichett, Newtonville, Mass., assignor to Media Arts Workshop Inc., Newton, Mass.

Filed May 24, 1976, Ser. No. 689,482

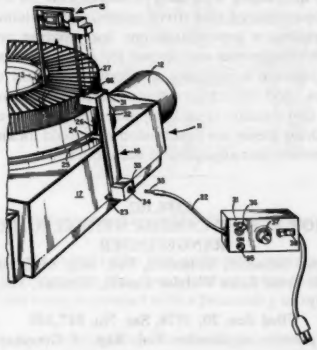
Int. Cl.[2] G03B *1/42, 21/00*

U.S. Cl. 353—95 **18 Claims**

1. A slide carrier system for use with a conventional projector of flat transparent slides, said projector being formed with a slot adapted to retain one of said transparent slides in a position common with the axis of the projector light bulb and lens assembly, said position being the slide projection position, said flat transparent slides being readily interchangeably placed in said slot, said slide carrier system comprising:

means for retaining a transparent slide;

a carrier frame, said means for retaining said transparent slide being mounted on said carrier frame for rotation with respect thereto, said carrier frame being adapted to be selectively placed into said slot in said projector so that



said transparent slide is in said slide projection position, said carrier frame and said transparent slides being interchangeable with each other to reside in said slot in said projector;

a motor mounted on said carrier frame;

means coupling said motor to said transparent slide retaining means for rotation thereof; and

means for coupling a source of power to said motor for selective rotation thereof.

4,188,101

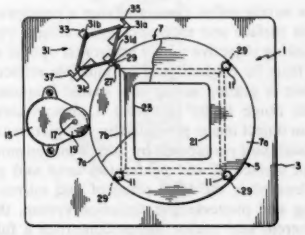
ROTATABLE SLIDE HOLDER

Hironori Masuda, 34-35 33rd St., Long Island City, N.Y. 11106

Filed Jun. 28, 1977, Ser. No. 810,866

Int. Cl.[2] G03B *1/48*

U.S. Cl. 353—95 **1 Claim**



1. A rotatable slide holder comprising:

support means;

slide gripping means including first and second spaced members adapted to maintain a slide between said members, one of said members being formed with four detents, each of said four detents being spaced 90° from the next adjacent one of said four detents, said member formed with said detents having a generally circular cross section and said detents geing indentations formed in the outer surface of said member;

means for rotationally fixing said members relative to one another;

coupling means for rotationally coupling said slide gripping means to said support means whereby said gripping means is adapted to rotate about an axis perpendicular to a plane of a slide maintained between said first and second members;

drive means mounted on said support means and coupled to said gripping means for rotating said gripping means; and

switching means coupled to said drive means and sequentially interacting with each of said detents for controlling the operation of said drive means, said swiching means comprising a pantograph, one leg junction comprising said locking means and the two leg junctions adjacent said one junction comprising the contacts of said switching means, said switching means including locking means such that rotation of said gripping means is prevented and said drive means are deactivated when said locking means are moved into engagement with a detent.

4,188,102

MIRROR REFLEX CAMERA WITH ELECTRONIC RANGEFINDER

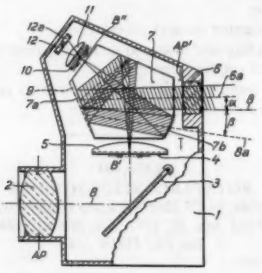
Klaus-Dieter Schaefer, Braunfels, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Jun. 20, 1978, Ser. No. 917,249

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1977, 2731192

Int. Cl.[2] G03B *3/10, 13/06, 13/16*

U.S. Cl. 354—25 **2 Claims**



1. In a mirror reflex camera having a pentaprism having a beam exit surface and means for generating a viewer axis, a picture taking objective with a horizontal optical axis offset in parallel from its original path by multiple reflections in said pentaprism, a grating acting as a spatial frequency filter, an electronic range finder including a photoelectric detection system, an object image projected by said picture taking objective through said pentaprism by mirror means mounted at the beam exit surface of said pentaprism onto said grating, said grating located in the focal plane of said mirror means and preceding said photoelectric detection system, the improvement wherein said mirror means comprises a fully specular concave mirror (*7b*) provided at the lower edge of the exit surface of said pentaprism (**7**) and comprising means for deviating said viewer axis (*8a*) of a beam issuing from said object image by an angle up to 5° downward with respect to said horizontal optical axis (**8**) onto said fully specular concave mirror (*7b*) and deviating another beam issuing from said object image onto the transparent part of the rear surface of said pentaprism and an ocular (**6**) with an axis offset upward from said deviated viewer axis and slanted so that the ocular axis (*6a*) subtends an angle up to 5° with respect to said horizontal axis (**8**) of said deviated viewer axis.

4,188,103

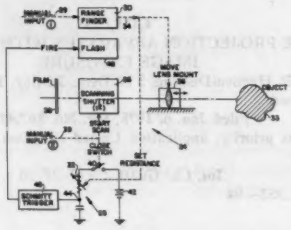
RANGE SYNCHRONIZED FLASH PHOTOGRAPHIC APPARATUS AND METHOD FOR ACHIEVING OPTIMUM FLASH EXPOSURE

Conrad H. Biber, Needham; Bruce K. Johnson, Andover, and George D. Whiteside, Lexington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 21, 1978, Ser. No. 898,546

Int. Cl.[2] G03B *7/10, 15/05*

U.S. Cl. 354—27 **24 Claims**



1. Apparatus for photographing a subject, comprising:

a scanning shutter which when actuated produces a predetermined, timewise variation in exposure aperture area;

ranging means for providing an output representative of the range of a subject;

a flash unit; and

means for actuating the shutter to start its scanning, the improvement comprising:

means for firing the flash unit to produce a flash of illumination after a time period, measured from the first light through the shutter, dependent on the output of the ranging means, the relationship between the time period and subject range establishing a parametric relationship between the brightness of the subject due to its flash illumination and the scanning time of the shutter, the inverse of this parametric relationship constituting the timewise variation in the exposure aperture area of the shutter.

4,188,104

AUTOMATIC CONTROL DEVICE FOR ELECTRONIC FLASH

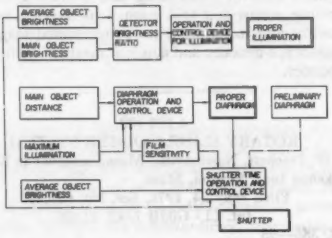
Takashi Uchiyama, Yokohama; Tetsuya Taguchi, Kawasaki, and Yukio Mashimo, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 471,561, May 20, 1974, abandoned. This application Jan. 13, 1977, Ser. No. 759,063

Claims priority, application Japan, May 24, 1973, 48/58369

Int. Cl.[2] G03B *15/05*

U.S. Cl. 354—31 **12 Claims**



1. The combination of a camera and an electronic flash device, said electronic flash device comprising:

brightness ratio detecting means which measures a brightness value of a main portion of a photographing scene upon which natural light is incident and a brightness value of a sub-portion of the scene upon which the natural light is incident, said means producing an electrical signal corresponding to a ratio of one brightness value with respect to the other;

flash light emitting means for generating a flash light to illuminate the photographing scene; and

first control means functionally connected to said flash light emitting means for controlling the quantity of the flash light generated by said flash light emitting means, said control being effected in accordance with the electrical signal from said brightness ratio detecting means and a maximum guide number value of the electronic flash device;

said camera including:

a first light sensitive element which measures a mean brightness value of the photographing scene upon which the natural light is incident, said element producing an electrical signal corresponding to the mean brightness value;

second control means which controls the quantity of light incident upon said first light sensitive element and the aperture size of the camera according to said maximum guide number value and information relating to a distance to said main portion of the scene being photographed; and

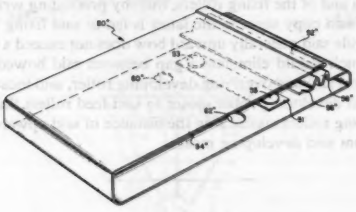
third control means connected to said first light sensitive element for controlling an exposure time of the camera according to the electrical signal from said first light sensitive element.

4,188,105

BATTERY CONTAINING FILM CASSETTE WHEREIN REMOVAL OF LAST SHEET INSULATES CONTACTS

Irving Erlichman, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 6, 1978, Ser. No. 957,978
Int. Cl.² G03B *17/26, 19/10*
U.S. Cl. 354—202 **21 Claims**



1. A photographic film assemblage comprising:

a film cassette having means for defining an exposure opening through which a film unit is adapted to be exposed, means defining an egress opening through which an exposed film unit is adapted to be advanced from the film cassette subsequent to exposure, and at least one aperture through which a pair of electrical contacts in a camera may extend so as to engage the terminals of a battery located within the film cassette;

a plurality of sheet-like members including several film units located within said film cassette;

a battery including a pair of terminals located within said film cassette with said terminals being located adjacent to and in alignment with said at least one aperture; and

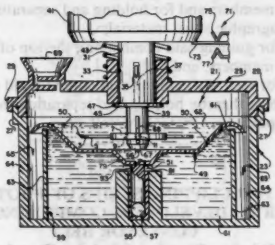
means coupled to the last of said sheet-like members to be moved from said cassette via said egress opening when located within the camera for electrically insulating said terminals from the camera contacts in response to the movement of said last sheet-like member from said film cassette.

4,188,106

APPARATUS AND METHOD FOR PROCESSING FILM

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 6, 1978, Ser. No. 949,331
Int. Cl.² G03D *3/04*
U.S. Cl. 354—330 **9 Claims**



1. Apparatus for processing a film disc, said apparatus comprising:

a tray for receiving a film disc and a processing solution;

means for rotating a film disc with respect to said tray, the film disc being in contact with a processing solution in said tray;

means supporting said tray for rotation about the same axis as that of a rotated disc; and

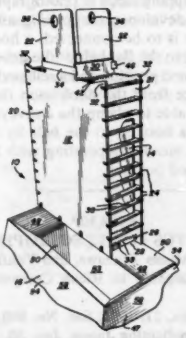
means for selectively coupling said tray and said rotating means for simultaneously rotating said tray and a film disc to centrifugally dishcarge the processing solution from said tray and the film disc after the disc has been processed in the solution.

4,188,107

PHOTOGRAPHIC PRINT PROCESSING SYSTEM

Robert W. Mitchell, 707 Myrtle Ave., Saint Joseph, Mich. 49085

Filed Jan. 10, 1979, Ser. No. 2,437
Int. Cl.² G03D *13/04*
U.S. Cl. 354—328 **19 Claims**



1. A photographic processing basket for use in processing flexible exposed photographic sheet material comprising:

substantially rectangular front and back members;

a handle extending upwardly from the top of said front and back members for holding the basket during use;

a plurality of spacers mounted along three sides and between said front and back members for holding said front and back members in spaced parallel relationship with each other creating a box-like structure;

each of said spacers having a means for receiving and separating said flexible photographic sheet material;

a plurality of base plates mounted in spaced relationship with each other across one side of said box-like structure and subtending at least some of said spacers for directing fluid and for creating solution turbulence when the basket is agitated within processing fluids;

a movable comb for engaging the top side of said front and back members and for holding and separating said flexible photographic sheet material;

means for guiding said comb along the top of said front and back members; and,

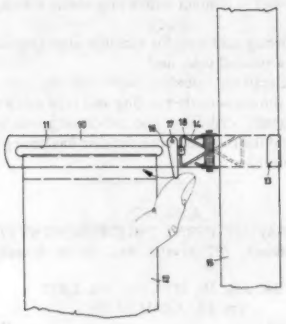
means for securely latching said comb to said front and back members thereby holding and separating the flexible photographic sheet material on all sides.

4,188,108

DEVICE FOR CLIPPING STRIPS OF PHOTOGRAPHIC PAPER TO DEVELOPERS COMPRISING A FLAT CONVEYOR BELT

Lodovico Falomo, Orcenigo Inferiore, Zoppola (Pordenone), Italy

Filed May 19, 1978, Ser. No. 907,616
Claims priority, application Italy, May 31, 1977, 24214A/77
Int. Cl.[2] G03D *13/10*
U.S. Cl. 354—345 **2 Claims**



1. A device for clipping strips of photographic paper to a flat conveyor belt of a developer, comprising a bar to which the photographic paper is to be connected, a hook at one end of said bar for hooking to the flat belt of the developer, a resilient clip having a preloaded position and a released position fixed to the bar at a distance from the hook such that the clip in its released position is able to clamp the conveyor belt on to the bar when the bar is hooked to the belt by the hook, and a releasable retention means cooperating with the clip to maintain it in its preloaded position.

4,188,109

FIXING APPARATUS FOR ELECTROPHOTOGRAPHY

Hiroyuki Idenawa; Misao Tanzawa, and Yukihiro Ohno, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 21, 1976, Ser. No. 698,457
Claims priority, application Japan, Jun. 30, 1975, 50/81225
Int. Cl.[2] G03G *15/00*; F27B *9/28*; H05B *1/00*
U.S. Cl. 355—3 FU **4 Claims**

1. An electrophotographic copying apparatus comprising in combination:

feed means having first and second rotating feed rollers to feed a copy sheet;

developing means to form a toner image on said copy sheet, said developing means comprising a developing roller disposed above the path of travel of said copy sheet;

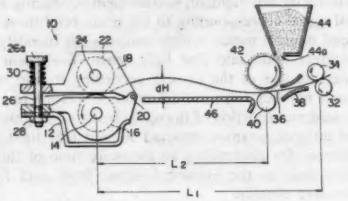
fixing means having first and second rotating fixing rollers to pressingly feed said copy sheet therebetween to fix the toner image to said copy sheet, said first and second fixing rollers having a bite at the point of contact therebetween;

an axis of said second fixing roller forming an acute angle with an axis of said first fixing roller such that a tangent line at the point of contact of the two fixing rollers at one longitudinal end of the fixing rollers extends downwardly in the direction of feed of the copy sheet and at the other longitudinal end extends upwardly in the direction of feed of the copy sheet;

said developing roller being located between said feed rollers and said fixing rollers and closer to said feed rollers than said fixing rollers;

the distance between said feed rollers and said fixing rollers being less than the length of said copy sheet;

said feed rollers feeding said copy sheet to said fixing rollers at a speed higher than the speed at which said fixing



rollers feeds said copy sheet therebetween such that said copy sheet between said fixing rollers and feed rollers bows generally upwardly to permit one side portion of the leading end of the copy sheet to be fed downwardly into said bite at the point of contact between said fixing rollers at said one longitudinal end of the fixing rollers and to permit the other side portion of the leading end of the copy sheet to be fed upwardly into the bite at the point of contact between said fixing rollers at said other longitudinal end of the fixing rollers, thereby precluding wrinkling of said copy sheet as the latter is fed to said fixing rollers while said generally upward bow does not exceed a height which would eliminate a gap between said bowed copy sheet and said overlying developing roller, said location of said developing roller closer to said feed rollers than said fixing rollers maximizing the distance of said upward bow from said developing means.

4,188,110

PHOTOCONDUCTIVE BELT SUPPORTING APPARATUS

Klaus K. Stange, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 3, 1978, Ser. No. 892,809
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—3 BE **6 Claims**

1. Photoreceptor support apparatus comprising in combination:

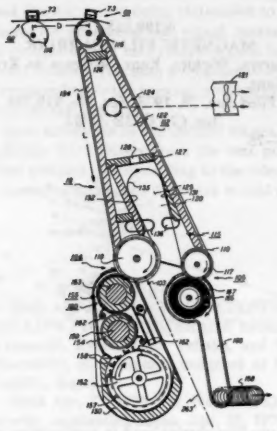
(a) at least two rotatable spaced apart belt supporting rolls, said rolls defining a belt run therebetween;

(b) an endless photoconductive belt disposed over said rolls, the length of said belt being greater than the length of the belt run defined by said rolls;

(c) means for drivingly rotating at least one of said rolls to produce uniform uninterrupted movement of said belt along the entire length of said belt;

(d) means forming a vacuum chamber interior of said belt run; and

(e) means for evacuating said chamber to draw the excess length of said belt into said chamber whereby to form a



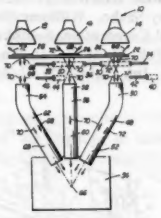
U-shaped belt loop while tensioning said belt to provide operative engagement with said rolls.

4,188,111

ADDITIVE TRI-COLOR LAMPHOUSE FOR A PHOTOGRAPHIC PRINTER

Roger L. Marvin, Wichita, Kans., assignor to Kreonite, Inc., Wichita, Kans.

Filed Sep. 15, 1978, Ser. No. 942,878
Int. Cl.[2] G03B *27/54, 27/76*
U.S. Cl. 355—37 **6 Claims**



1. An additive tri-color lamp house for a photograph printer, the lamp house comprising:

a lamp house housing;

a first lamp, a second lamp, and a third lamp, said lamps mounted in said housing for passing light therethrough;

a fixed filter holder mounted in said housing, said holder disposed in front of said lamps, said holder including a first yellow filter positioned in front of said first lamp, a red filter positioned in front of said second lamp, and a first magenta filter positioned in front of said third lamp;

light guide means mounted in said housing and disposed in front of said yellow, red and magenta filters for receiving the filtered light therefrom; and

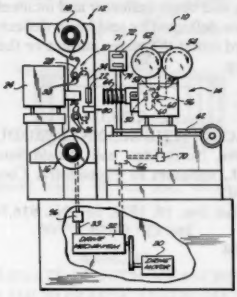
a mixing chamber disposed in said housing and communicating with said light guide means for receiving the filtered light therefrom and mixing the filtered light therein.

4,188,112

OUT-OF-FRAME DETECTOR FOR MOTION PICTURE FILM DUPLICATING EQUIPMENT

Michael D. Hamilton, 98 Chambers St., New York, N.Y. 10007

Filed Jun. 21, 1978, Ser. No. 917,562
Int. Cl.[2] G03B *27/48*
U.S. Cl. 355—50 **11 Claims**



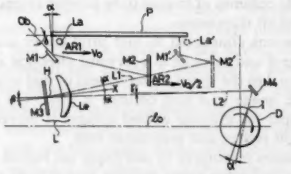
1. In a printer of the type comprising: a takeup reel, a supply reel, means for transporting film along a path between said supply reel and said takeup reel, means for continuously driving said transport means, and a gate wherein film is positioned for exposure during cycles of said gate the improvement comprising: first encoder means driven by said film positioned along the path of said film between the supply reel and gate, said first encoder being adapted to generate signals indicative of the length of film driving the encoder between cycles of said gate; second encoder means driven by said transport means, said second encoder being adapted to generate signals indicative of the length of film driven by said transport between cycles of said gate; and comparator means connected to said first and second encoder means and adapted to generate a signal in the event said first encoder signal and second encoder signal do not match.

4,188,113

COPYING DEVICE WITH FACSIMILE FUNCTION

Michio Hiraga, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 12, 1978, Ser. No. 950,871
Claims priority, application Japan, Oct. 14, 1977, 52/122316
Int. Cl.[2] G03B *27/48, 27/50, 27/70*
U.S. Cl. 355—51 **6 Claims**



1. In a copying machine having a plane stationary platen for holding a document, a photosensitive medium, a first scanning mirror driven in parallel with the platen surface at the same speed as a photosensitive medium, a second scanning mirror driven synchronously at half the speed of the first scanning mirror and in the same direction therewith, an in-mirror lens comprising a reflex mirror and a spherical lens system, and a fixed reflex mirror located on the same side as the first and second scanning mirrors with respect to the in-mirror lens and serving to reflect an image-forming beam from the in-mirror

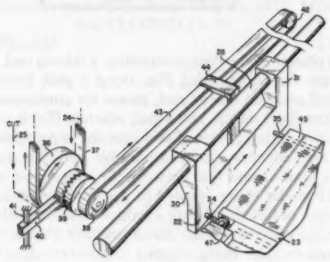
lens toward the photosensivie medium; the improvement comprising, facsimile functions means disposed in said machine having, a beam deflector comprising, a spherical lens system, a rotary polyhedral mirror, and rotary mirror driving means, said beam deflector disposed switchably at a position optically equivalent to the nodal point of the in-mirror lens; a laser source; an incident optical system for directing the laser beam from said laser source toward said beam deflector; and means for positioning said beam deflector and incident optical system so that the beam deflected by said beam deflector is selectively directed toward either the platen surface or the photosensitive medium surface.

4,188,114

MICROFICHE SCANNER MODULE

Karl H. Gensike, Northridge, and Ronald Sam, Los Angeles, both of Calif., assignors to Photomatrix Corporation, Santa Monica, Calif.

Filed Jun. 19, 1978, Ser. No. 916,946
Int. Cl.[2] G03B *27/44*
U.S. Cl. 355—54 **3 Claims**



1. A microfiche scanner module for insertion in a microfilm reader/printer projector including a light source, projection lens, print paper moving means, paper cut button and display screen, as a substitute for the normal microfilm cartridge mechanism for said projector, said module comprising:

(a) a supporting frame positionable in said reader/printer projector between said light source and projection lens in the opening normally occupied by said microfilm cartridge mechanism;

(b) a carriage mounted on said supporting frame for movement in a fore and aft direction;

(c) a film platen mounted on said carriage for movement in a left and right direction, said film platen being dimensioned to hold a microfiche having a plurality of side-by-side columns of images to be printed extending in said fore and aft directions;

(d) means connected to said print paper moving means to move said carriage in a forward direction at a rate proportional to the speed of movement of said print paper so that the image in a first column is projected onto said print paper for printing as said column is moved between said light source and projection lens;

(e) means responsive to said paper cut button for disconnecting said print paper moving means from said carriage so that said carriage can be retracted to its initial position; and,

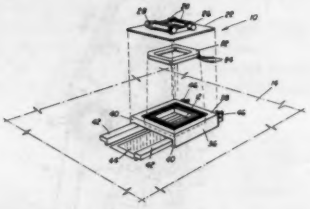
(f) means for moving said film platen to the right to position the initial portion of the next adjacent column between said light source and lens, whereby said carriage can again be moved in a forward direction by reconnecting it to said print paper moving means at a rate proportional to the speed of movement of said print paper so that said next column image is printed, the process being repeated to thereby provide a continuous series of paper print readouts of the information in the column images respectively the same as though the column images were provided successively on microfilm.

4,188,115

MAGNETIC FILM CARRIER

Roger L. Marvin, Wichita, Kans., assignor to Kreonite, Inc., Wichita, Kans.

Filed Jun. 28, 1978, Ser. No. 919,754
Int. Cl.[2] G03B *27/62*
U.S. Cl. 355—75 **4 Claims**



1. A magnetic film carrier used in conjunction with a light source in a lamphouse of a photographic printer, the top of the lamphouse having a planar surface, the carrier comprising:

a flat metal plate having an aperture through the center thereof;

a film holder mounted on top of the plate and adapted for holding the film above the aperture in the plate; and

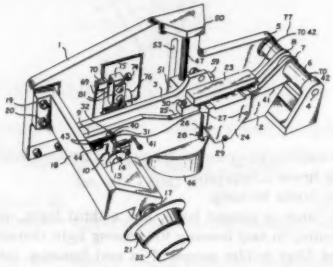
magnetic means adapted for receipt in the lamphouse and around the light source and magnetically attracting and holding the flat metal plate on top of the planar surface of the lamphouse, the flat metal plate movable in a plane parallel to the plane of the top of the lamphouse so that angular adjustments can be made thereon for misalignment of photographs and cropping of photographs.

4,188,116

ABBE REFRACTOMETER

Stephen A. Bartfay-Szabo, Williamsville, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed Feb. 21, 1978, Ser. No. 879,315
Int. Cl.[2] G01N *21/46*
U.S. Cl. 356—137 **9 Claims**



1. In a refractometer having a frame, a primary prism for holding a specimen, a light source, and a movable mirror, the improvement comprising

mounting means carrying said mirror and connected to said frame for movement along a first path,

first drive means for moving said mounting means to a selected position,

follower means connected to said frame for movement along

a second path, a rest position for the follower being located at one end of said second path,

electric means for driving said follower along the second path, said electric means being responsive to a signal,

control means for generating said signal, means for activating said control means, said control means being responsive to said follower reaching a location along the second path corresponding to the selected position of said mounting means on the first path,

whereby upon activation of the control means, the electric means drives the follower from the rest position to an equivalent position corresponding to the selected position of said mounting means and then back to said rest position.

4,188,117

METHOD AND APPARATUS FOR DETECTING LEAKS IN HOLLOW FIBER MEMBRANE MODULES

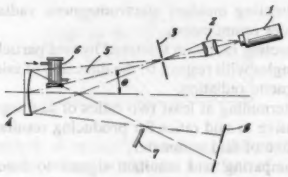
Kazuhisa Yamauchi, Kyoto; Taku Tanaka, and Syuji Kawai, both of Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Apr. 27, 1978, Ser. No. 900,582

Claims priority, application Japan, Apr. 28, 1977, 52-50416

Int. Cl.² G01N *21/16*

U.S. Cl. 356—237 **8 Claims**



1. A method for detecting leaks from a hollow fiber membrane module comprising a housing having at least one bundle of hollow fibers positioned therein with at least one end of each said bundle being sealed by a cemented layer, said method comprising the steps of:

directing gas under pressure over the external surfaces of the fibers within the housing, said gas having a refractive index different from the refractive index of the ambient atmosphere; and

optically monitoring an atmospheric volume adjacent the cemented end of the module to detect any refraction patterns caused by leaks of said gas through the cemented end.

4,188,118

MANIPULATOR FOR ROTATING AND EXAMINING SMALL SPHERES

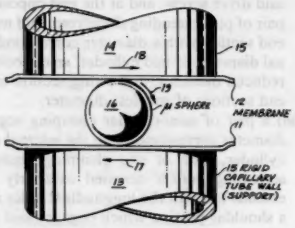
Berthold W. Weinstein, and David L. Willenborg, both of Livermore, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 17, 1978, Ser. No. 906,815

Int. Cl.² G01N *21/16, 21/32*

U.S. Cl. 356—244 **6 Claims**

1. An apparatus for rotating a small spherical member about either of two axes without moving the center of the spherical member comprising: a pair of oppositely located members each having adjacent smooth, flat surfaces for retaining an associated spherical member therebetween by substantially frictional contact, and movable means connected to each of said members for moving said members in two directions parallel to said surfaces for rolling an associated spherical member retained



therebetween about either of two axes without moving the center thereof.

4,188,119

TWO-COORDINATE LENGTH MEASURING DEVICE FOR MICROSCOPIC INSTRUMENTS

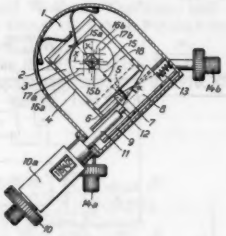
Karl-Wilhelm Schenck, Hermannstein; Gunthard Nissel, Wetzlar, and Erich Schuster, Huttenberg, all of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Feb. 16, 1978, Ser. No. 878,340

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1977, 2707960

Int. Cl.² G02B *27/36*

U.S. Cl. 356—252 **6 Claims**



1. A two-coordinate measuring device for use in the measuring ocular of a microscopic measuring instrument for measuring the dimensions of an object, said object having object axes (x and y coordinates), comprising:

(a) two reference mark carriers, mounted movably with respect to each other in an intemediate image plane of said instrument, said reference mark carriers having the same path of movement and having a direction of movement which forms an angle of 45° with the object axes, said carriers each having a reference mark thereon, each reference mark comprising two perpendicular lines forming a 90° angle, with the two angles being oriented in opposite directions, such that the bisector of the angle of each of said reference marks coincides with the direction of movement of said carrier; and

(b) means mounted in said measuring ocular for separately adjusting the position of each of said mark carriers in order to align said reference marks with the dimensions of said object, said object, said adjustment means comprising a pair of independently operable drive screws, mounted in said ocular at an angle of 45° with respect to the object axes, which engage said carriers, and means for the rapid setting of said drive screws, said rapid setting means comprising:

(i) a cylinder solidly mounted on said ocular having a pair of oppositely disposed longitudinal holes therein;

(ii) a circular nut which is slidable within said cylinder, and has a threaded central bore whose threads engage said drive screw, and at the end opposite said ocular, a pair of pins extending therefrom, said nut comprising an end section with a diameter corresponding to the internal diameter of said cylinder, an opposite end section of reduced diameter, and a ring section intermediate said end sections of smallest diameter;

(iii) a pair of semi-circular clamping segments having a diameter corresponding to the internal diameter of said cylinder, each of said clamping segments having an activating button mounted exteriorly thereon which extends through the longitudinal holes in said cylinder, a shoulder portion which engages said nut and rests in said nut ring section, a bead on the outer surface thereof, a semi-circular depression on the interior surface thereof for passage of said drive screw, and a pair of transverse bores; and

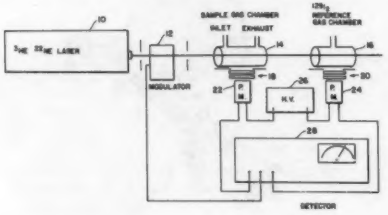
(iv) a pair of springs which are seated in the corresponding transverse bores of said clamping segments which bias said segments apart.

4,188,120

RADIOIODINE DETECTOR BASED ON LASER INDUCED FLUORESCENCE

Jimmie R. McDonald, Upper Marlboro, Md., and Andrew P. Baronavski, Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 6, 1978, Ser. No. 867,412
Int. Cl.[2] G01J *3/30*
U.S. Cl. 356—318 **9 Claims**



1. Apparatus for measuring the concentration of I-129 in a gaseous mixture including other iodine isotopes comprising:

laser means for producing a laser beam of a wavelength of 6328 Å capable of raising said I-129 isotope to a metastable excited electronic state, said laser using $^3He^{22}Ne$ gas as the lasing medium;

means for modulating said laser beam with a low frequency;

sample gas-chamber means for receiving and containing a sample of said gas containing an I-129 isotope, said sample gas-chamber means having said laser beam incident thereon for generating fluorescence emissions from said I-129 isotope;

reference gas-chamber means containing a reference sample of said I-129 isotope having a known concentration, said reference gas-chamber means having said laser beam incident thereon for generating fluorescence emissions from said I-129 reference;

means for receiving and converting said fluorescence emission from said sample gas chamber to a sample electrical signal;

means for receiving and converting said fluorescence emissions from said reference gas chamber to a reference electrical signal; and

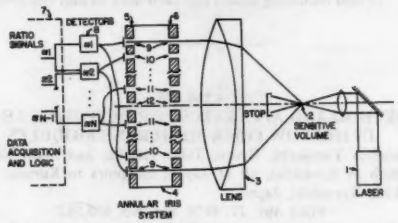
detector means receiving said sample and reference electrical signals for measuring the concentration of said I-129 isotopes therefrom.

4,188,121

MULTIPLE RATIO SINGLE PARTICLE COUNTER

Edwin D. Hirleman, Jr., 432 E. Laguna, Tempe, Ariz. 85282, and Sigmar L. K. Wittig, Hooverstrasse 27, D75 Karlsruhe 41, Fed. Rep. of Germany

Filed Feb. 1, 1977, Ser. No. 764,657
Int. Cl.[2] G01N *15/02*
U.S. Cl. 356—336 **3 Claims**



1. A system for determining a parameter of a particle comprising:

means for directing incident electromagnetic radiation to a particle under examination,

means for detecting radiation scattered by said particle at more than two angles with respect to the direction of said incident electromagnetic radiation,

means for determining at least two ratios of said signals,

means responsive to said ratios for producing resultant signals representative of said parameter,

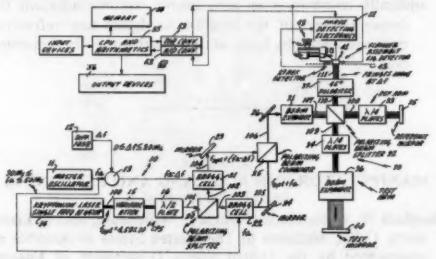
means for comparing said resultant signals to determine an unambiguous measure of said parameter.

4,188,122

INTERFEROMETER

Norbert A. Massie, Thousand Oaks, and Sandor Holly, Woodland Hills, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 27, 1978, Ser. No. 890,096
Int. Cl.[2] G01B *9/02*
U.S. Cl. 356—349 **16 Claims**



13. In an interferometer having a beam splitter for splitting an incoming beam into two components being directed towards different reflecting surfaces and being recombined into a composite beam, the improvement for producing the incoming beam comprising:

means for providing a monochromatic beam;

means disposed to receive said beam for splitting the beam into two coherent monochromatic components;

first and second frequency shifting means;

means operatively connected to the first and second frequency shifting means to obtain two different frequency shifts;

said first and second means being disposed for frequency shifting at least one of the components, so that the two components differ in frequency by an amount equal to a difference in said two frequency shifts;

means for polarizing the two beam components differently; and

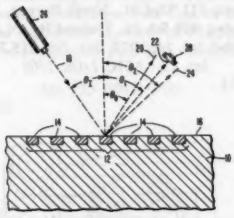
means for recombining the two beams components to produce a single beam having two differently polarized components of differing frequencies.

4,188,123

OPTICALLY MEASURING THE CARRIER CONCENTRATION IN A SEMICONDUCTOR

Hans P. Kleinknecht, Bergdietikon, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Aug. 30, 1978, Ser. No. 938,246
Int. Cl.² G01N 21/22
U.S. Cl. 356—354 **8 Claims**



1. A method of optically measuring the concentration of carriers in a doped region adjacent a surface of a semiconductor wafer comprising the steps of:

selectively introducing conductivity modifiers into both said wafer and a test substrate simultaneously to form respectively said doped region in said wafer and a diffraction grating pattern in said substrate including periodically-spaced doped strips adjacent a surface of said substrate,

exposing said diffraction grating pattern to a beam of monochromatic light, whereby said diffraction grating pattern functions as a reflection phase grating, diffracting said beam of monochromatic light into diffracted beams of various orders, and

measuring the intensity of one of said diffracted beams, whereby the magnitude thereof is a measure of the carrier concentration in said doped region.

4,188,124

INTERFEROMETRIC MEASURING SYSTEM

Walter Jaerisch, Boeblingen, and Guenter Makosch, Sindelfingen-Maichingen, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

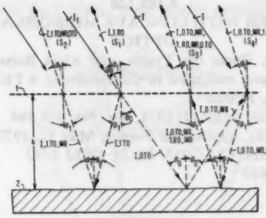
Filed Aug. 1, 1977, Ser. No. 820,985
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1976, 2636211
Int. Cl.² G01B 9/02
U.S. Cl. 356—356 **3 Claims**

1. A method of generating an interference fringe pattern for measurement of irregularities in the evenness of surfaces comprising

interposing an optical grating intermediate a source of coherent light and a test surface;

directing said light to said test surface at angle of incidence to generate two interference fields forming a beat pattern in which the light reflected from the grating is combined with parallel rays of radiation diffracted on passage through the grating and reflected from said test surface including portions thereof diffracted on return passage through said grating, and

projecting said combined light beams onto an image plane,



wherein the grating constant "g", the angle of incidence θ_0, angle of observation θ_1, wavelength λ of the beam source "I" and distance "h" between the grating and test surface conform to the relationship

$$h = \frac{\lambda}{4\,|(\cos\theta_1 - \cos\theta_o)|}$$

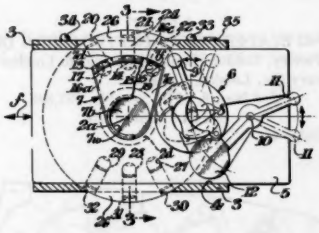
wherein the angle of incidence $\theta 0$ is a function of said grating constant "g" in accordance with the relationship $\sin \theta 0 = \sin \theta_1 \pm g\lambda$

4,188,125

APPARATUS FOR THE DETERMINATION OF THE COLOR COMPOSITION OF THE PRINTING LIGHT IN A PHOTOGRAPHIC ENLARGER

Siegfried Barbieri, and Wolfgang Kapfinger, both of Brixen, Italy, assignors to Durst AG Fabrik Fototechnischer Apparate, Bolzano-Bozen, Italy

Filed Sep. 2, 1977, Ser. No. 830,105
Claims priority, application Italy, Sep. 2, 1976, 4847 A/76
Int. Cl.² G01J 3/50
U.S. Cl. 356—404 **12 Claims**



9. An apparatus for determining the color composition of printing light in a photographic enlarger having an objective lens with an intermediate diaphragm chamber by utilizing color-sensitive photoelectric transducer means comprising a construction and arrangement wherein the light in the intermediate diaphragm chamber is caused to impinge on the photoelectric transducer means whereby the color composition of the light in the intermediate diaphragm chamber is interpreted, the photoelectric transducer means is disposed outside of the intermediate diaphragm chamber, a light conducting means is disposed within the intermediate diaphragm chamber and extends therefrom to impinge light sampled from the intermediate diaphragm chamber upon the photoelectric transducer means, slide means is mounted on the objective lens for disposing different portions thereof optionally wherein the light-conducting means is mounted on a portion of the slide means for optional insertion inside of the intermediate diaphragm cham-

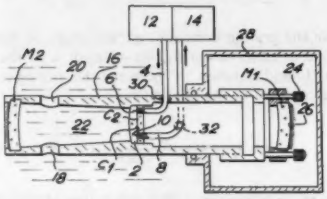
ber for sampling the light to determine its color composition and outside of the intermediate diaphragm chamber to permit an exposure to be performed.

4,188,126

PHOTOMETER WITH CONCAVE MIRRORS AND FIELD OPTICS

Gilbert Boisde, Bures sur Yvette, and Alain Boissier, Orsay, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 12, 1978, Ser. No. 905,344
Claims priority, application France, May 13, 1977, 77 14753
Int. Cl.[2] G01N *21/24;* G01J *1/42*
U.S. Cl. 356—440 **10 Claims**



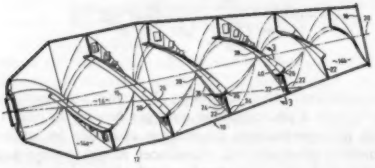
1. A photometer of the type comprising two facing mirrors, means for introducing a light beam between said mirrors, extraction means for said light beam after multiple reflections on the mirrors and means for introducing a fluid to be measured between these mirrors, wherein the two mirrors are concave mirrors, whose centres of curvature are slightly staggered relative to one another and wherein it comprises a field optics by transmission disposed in the vicinity of the centres and which optically conjugates the mirrors, the light beam introduction means comprising a first optical system having an exit pupil in the vicinity of the field optics, the extraction means of the light beam comprising a second optical system having an entrance pupil in the vicinity of the field optics, said entrance and exit pupils being optically conjugated by the action of the multiple reflections on the mirrors.

4,188,127

MIXING BLADES OF CONCRETE MIXING DRUMS

Jess W. Pawley, London, Canada, assignor to London Concrete Machinery Co., London, Canada

Filed Nov. 6, 1978, Ser. No. 957,868
Int. Cl.[2] B28C *5/20*
U.S. Cl. 366—44 **4 Claims**



1. In a rotary concrete mixing drum having an inner wall defining a mixing chamber which includes a mixing section and a charging throat section, said drum having a head end and an open charging end arranged at opposite ends thereof, said drum being mounted for rotation about a mixing axis extending between said head end and said discharge end, said charging throat section extending inwardly from said charging end to said mixing section, mixing blade means mounted on and extending spirally along said inner wall from adjacent said charging end to adjacent said head end, said mixing blades having a mixing face directed toward said head end and the discharge face directed toward said charging end, the portion of the mixing face extending within the charging throat section being a charging face, the improvement wherein said mixing blade comprises;

(a) a leg portion projecting inwardly from said inner wall,

(b) a discharge lip portion projecting laterally from an inner end of said leg portion in a direction toward said charging end, said leg portion and said discharge portion being connected to one another before said leg portion is secured to said inner wall of said chamber,

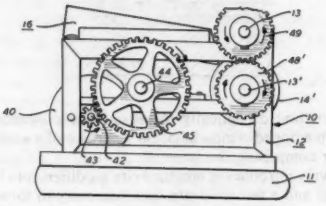
(c) a mixing lip projecting laterally from said charging face of said leg portion in a direction toward said head end, said mixing lip extending over at least a major portion of said mixing section inwardly from said charging throat section, said mixing lip being secured to said leg portion by welding thereto after said leg portion is secured to said inner wall of said chamber such that said mixing lip does not inhibit mounting of the leg portion within said chamber.

4,188,128

APPARATUS FOR AUTOMATICALLY KNEADING AND STRETCHING A MIXTURE

Jorge Betancourt, 111 73rd St., North Bergen, N.J. 07047, and Jose Hernandez, 408-5th St., Union City, N.J. 07087

Filed Jul. 14, 1977, Ser. No. 815,728
Int. Cl.[2] A21C *1/08, 1/08*
U.S. Cl. 366—72 **9 Claims**



1. An apparatus for automatically kneading and stretching a mixture of ingredients used in preparation of an article of food, comprising:

(a) a frame, which is portable;

(b) a plurality of rollers;

(c) means for supporting the rollers in the frame so as to form an open space therebetween for movement of the mixture of ingredients therethrough;

(d) means for driving the plurality of rollers, such that the mixture of ingredients may be pulled thereby through the open space therebetween; and

(e) means for supporting the mixture of ingredients in an inclined position so as to continuously feed such mixture into the space between the plurality of rollers.

4,188,129

DEVICE FOR OBTAINING LATERAL AND VIBRATIONAL MOVEMENT WITHIN ROTATABLE RECEPTACLES

Roy F. Thompson, 1909 W. 6th St., Aberdeen, Wash. 98520

Filed Mar. 27, 1978, Ser. No. 890,194
Int. Cl.[2] B24B *31/02;* B01F *9/00, 11/00*
U.S. Cl. 366—108 **3 Claims**

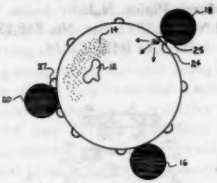
1. A vibrational rotatable receptacle comprising:

a cylindrical drum,

a series of rotation bars located about the circumference of the drum and being properly positioned to freely support the cylindrical drum and allow movement relative to the rotation bars;

a series of projections attached at either end of the cylinder

of the cylindrical drum wherein the projections are staggered such that when a rotation bar passes over a projection at one end of the cylinder, the rotation bar does not pass over a projection at the opposite end of the cylindrical drum.



4,188,130

DEVICE FOR CONTINUOUSLY MIXING WOOD CHIPS WITH BINDER

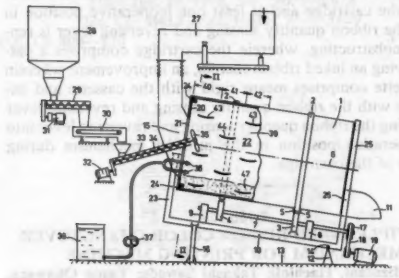
Kaspar Engels, Mannheim, Fed. Rep. of Germany, assignor to Draiswerke GmbH, Mannheim, Fed. Rep. of Germany

Filed Sep. 20, 1978, Ser. No. 943,983

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1977, 2744522

Int. Cl.² B01F 9/00

U.S. Cl. 366—228 **3 Claims**



1. Apparatus for continuously mixing wood chips with a binder, comprising a cylindrical mixing drum having end walls and drivable about its central lengthwise axis, said drum having an inlet aperture for the wood chips in one end wall and an outlet aperture for the wood chips coated with binder in the other end wall, built in pockets provided on the inner wall of said drum, said pockets being open in the rotational direction of said drum, to scoop up wood chips from a chip bed located in the bottom of said drum, and means for distributing the binder in the interior of the mixing drum, wherein said means for distributing said binder terminate in the area of the interior of said drum which is associated with the descending part of said drum wall.

4,188,131

SELF-SCRAPING MIXERS

Jean-Claude Duguet, Paris, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

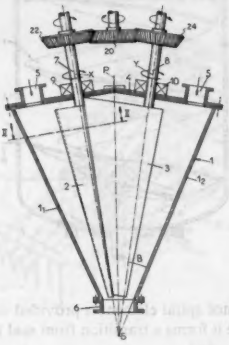
Filed Jul. 6, 1978, Ser. No. 922,588

Claims priority, application France, Jul. 8, 1977, 77 21104

Int. Cl.² B01F 7/16

U.S. Cl. 366—301 **7 Claims**

1. A self-cleaning mixer comprising a housing having a top and side wall members which together define an inner chamber, said inner chamber having an inner face, at least two blades rotatably mounted within the housing, said blades having a cross section defined by at least two arcs of a circle having the same length and the same radius R, and means for rotating these blades about their axes, said blades being arranged and dimensioned so that during their rotation their edges scrape the inner face of the inner chamber as well as the lateral faces of each blade, these blades remaining constantly



staggered in relation to each other by the same angle A when they are in mutual contact, the inner face of the inner chamber and the outer faces of the blades extending along truncated cones having the same apex with the axes of rotation of the blades passing through this apex wherein the radius R is given by the formula:

$$R = \frac{KD}{2} \cdot \left(m + \frac{1 - K^2}{m}\right) \quad (1)$$

in which the coefficient K is equal to cos A/2, D is the diameter of the envelope circle of the cross-section of a blade during its rotation and m is given by the formula:

$$m = \frac{1 - K + (1 - 2K^2 + K^3) \cdot tg^2 B}{1 + K \cdot (2 - K) \cdot tg^2 B} \quad (2)$$

where angle B is the semi-angle at the apex, at least equal to 5 degrees, of the envelope conical surface of a blade during its rotation.

4,188,132

SPIRAL STIRRER UNSUPPORTED AT ONE END

Wolfgang Lenart, Ludwigshafen; Wolfgang Rau, Heidelberg, and Hubertus Baron, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 19, 1978, Ser. No. 926,086

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1977, 227711[U]

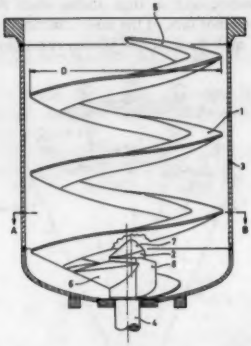
Int. Cl.² B01F 7/24

U.S. Cl. 366—314 **4 Claims**

1. In a spiral stirrer assembly comprising a stir vessel, a stirring spiral unsupported at its upper end and comprising a plurality of spiral turns of hollow profiles, the lower end of the spiral, facing the bottom of the stir vessel, being attached to a

hub in turn seated on a drive shaft which passes through the bottom of the stir vessel,

the improvement



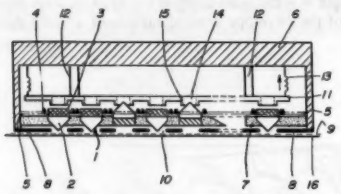
that a distributor spiral element is provided on said hub at a level where it forms a transition from said hub to the first turn of the spiral.

4,188,133

DOT MATRIX IMPACT PRINTER EMPLOYING MAGNETIC DOT ELEMENTS

Hirotoshi Matsui, Shiki, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 27, 1978, Ser. No. 881,254
Claims priority, application Japan, Feb. 28, 1977, 52-22089
Int. Cl.[2] B41J *3/10*
U.S. Cl. 400—121 **12 Claims**



1. A dot matrix printer for printing a desired pattern on a record receiving member in accordance with print information in a dot matrix fashion comprising:

a magnetic dot element including an impact tip end;

support means for supporting said magnetic dot element, said support means acting in conjunction with said magnetic dot element to permit said magnetic dot element to rotate along an axis transverse to the longitudinal axis of said magnetic dot element and to shift in position along an axis substantially parallel to the longitudinal axis of said magnetic dot element;

magnetic field creating means for controlling the orientation of said magnetic dot element about the transverse axis relative to said support means; and

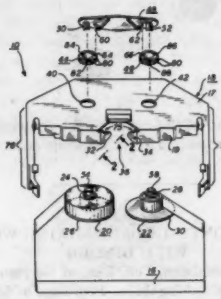
depression means for depressing said magnetic dot element toward said record receiving member.

4,188,134

RIBBON CARTRIDGE HAVING CAM MEANS FOR MOVING RIBBON SENSING AND REVERSING LEVER

John A. Garrido, Manalapan, N.J., assignor to Litton Business Systems, Inc., Morris Plains, N.J.

Filed Nov. 3, 1977, Ser. No. 848,136
Int. Cl.[2] B41J *33/14*
U.S. Cl. 400—208 **14 Claims**



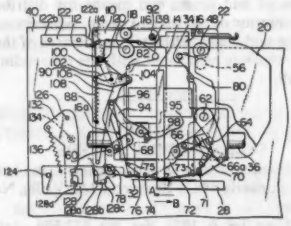
1. In a ribbon cartridge for insertion into a printing mechanism having a ribbon quantity sensing and reversing lever movable between at least one operative position in which the ribbon quantity sensing and reversing lever obstructs the insertion of the cartridge and at least one inoperative position in which the ribbon quantity sensing and reversing lever is rendered unobstructing, wherein the cartridge comprises a cassette having an inked ribbon therein, an improvement wherein the cassette comprises means rigid with the cassette and engageable with the ribbon quantity sensing and reversing lever for moving the ribbon quantity sensing and reversing lever into the inoperative position in the printing mechanism during insertion of the cartridge.

4,188,135

MULTIPLE INKED RIBBON COLOR CHANGEOVER MECHANISM FOR PRINTING MACHINE

Nagao Mizutani, Hachioji; Takashi Sawada; Yasuo Okawara, both of Sayama; Michio Koizumi, and Toshio Kurihara, both of Tokorozawa, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Aug. 23, 1977, Ser. No. 827,054
Claims priority, application Japan, Aug. 31, 1976, 51-104151
Int. Cl.[2] B41J *35/22*
U.S. Cl. 400—214 **20 Claims**



1. In an inked ribbon changeover mechanism for a printing machine having a printing head for impacting a record medium to print a character thereon by means of a looped portion of a selected one of a plurality of inked ribbons, a frame, and a carrier supporting said printing head and guided by carrier guides secured to said frame, the improvement comprising:

a plurality of stationary guide members engaging with said plurality of inked ribbons, respectively, at fixed positions relative to said printing head;

a plurality of movable guide members engaging with said plurality of inked ribbons, respectively, to guide said plurality of inked ribbons in a direction of their lengths;

means for carrying said plurality of movable guide members, said carrying means being movable along a path parallel to the direction of said lengths to shift a selected one of said movable guide members to an operative position relative to a selected one of said stationary guide members whereby said selected one of said movable guide members maintains said looped portion of said selected one of said plurality of inked ribbons in a predetermined orientation between said printing head and said record medium.

4,188,136

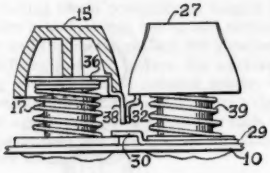
KEYBOARD SWITCH ACTUATOR AND LOCKING ASSEMBLY

Michael F. Bedocs, Waukegan, Ill., assignor to Cherry Electrical Prod's. Corp., Waukegan, Ill.

Filed Jan. 19, 1978, Ser. No. 870,672

Int. Cl.[2] B41J *5/22;* **H01H** *9/26, 3/20*

U.S. Cl. 400—276 **3 Claims**



1. A key actuator and locking mechanism for use with a keyboard having a matrix of key-receiving openings for positioning a plurality of key housings thereon wherein the improvement comprises

(a) a first and second manually operated switch key, each including a key stem projecting out of an identical switch housing which are adapted to be selectively mounted within the key-receiving openings formed in the keyboard,

(b) a latch plate mounted on and movable with the stem of said first switch key and providing a latching cam extending transversely of and in spaced relation to said stem of said first key switch,

(c) a latch spring consisting of a single spring wire adapted to embrace the housing of said first switch key and providing a deflectable raised biased latch leg positioned in the path of movement of said latching cam when said first switch key is depressed and cooperating therewith to releaseably hold said first switch key in a depressed position, and

(d) a latch releasing cam carried by the stem of said second switch key and engageable with said deflectable latch leg when said second switch key is depressed so as to deflect said latch leg against its bias out of engagement with said latching cam to release said first switch key from its depressed position.

4,188,137

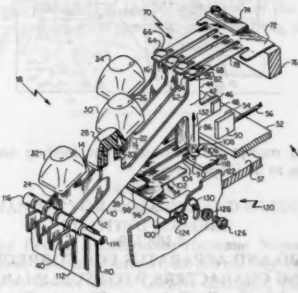
LOW SILHOUETTE KEYBOARD

Hugh St. L. Dannatt, Bethal, Conn., assignor to SCM Corporation, New York, N.Y.

Filed Dec. 12, 1977, Ser. No. 859,425

Int. Cl.[2] B41J *5/08*

U.S. Cl. 400—496 **10 Claims**



1. A keyboard for business machines having a frame, the keyboard comprising:

a plurality of T-shaped keylevers including a vertical extending cross arm forming a portion of said T-shape;

a first flexible keylever support member for each of said plurality of keylevers having one end fixedly supported on the frame and horizontally extending straight toward one of said keylevers in one direction;

a second flexible keylever support member for each of said plurality of keylevers having one end fixedly supported on the frame and horizontally extending straight toward said one keylever in an opposite direction from said first flexible keylever support member;

a first movable connection means coupling said first flexible keylever support member to said one keylever at one end of said cross arm;

a second movable connection means coupling said second flexible keylever support member to said one keylever at an opposite end of said cross arm vertically spaced from said one end of said cross arm; and

said first and second movable connection means cooperate in response to depression of said one keylever to nullify horizontal forces effecting the directional movement of said one keylever thereby resulting in controlled movement of said one keylever in a vertical direction.

4,188,138

SWITCH MEANS FOR JOURNAL PAPER FEEDING AND RECEIPT PAPER FEEDING CONTROL CIRCUIT

Masao Yamazaki, Kawaguchi, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed Jul. 24, 1978, Ser. No. 927,376

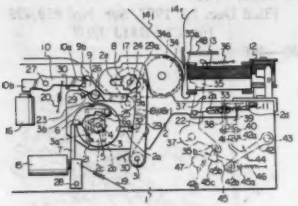
Claims priority, application Japan, Aug. 10, 1977, 52-106245[U]

Int. Cl.[2] B41F *13/00;* **G06C** *25/00*

U.S. Cl. 400—586 **3 Claims**

1. Printer having at least a receipt paper feeding and printing mechanism and a journal paper feeding and printing mechanism each adapted to be operated in synchronism by a control circuit, wherein the improvement comprises mechanical switching means adapted to be operated for rendering either one of said receipt and journal paper feeding and printing mechanisms to be inoperative and a switch connecting said one of said receipt and journal paper feeding and printing mechanisms to said control circuit, said switch being operatively

coupled with said mechanical switching means so as to be opened when said switching means is operated to render said



one of said receipt and journal paper feeding and printing mechanisms to be inoperative.

4,188,139

METHOD AND APPARATUS FOR CORRECTABLY PRINTING CHARACTERS WITH SUBLIMABLE INK

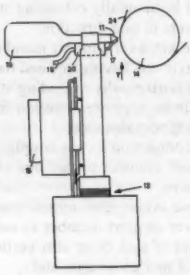
Arnaldo Pasini; Claudio Dalmasso; Riccardo Brescia, all of Ivera, and Roberto Bosio, Cascinette d'Ivera, all of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Italy

Filed May 6, 1977, Ser. No. 794,514

Claims priority, application Italy, May 10, 1976, 68142 A/76

Int. Cl.[2] B41J *29/16*

U.S. Cl. 400—696 **17 Claims**



1. A method for correctably printing alphanumeric characters visible under ordinary light, comprising the steps of printing the characters with an ink containing sublimable coloring agents selected from the group consisting of anthraquinone, azo, azomethines, stilbenes, nitrodiarylamines, acridines, xanthones and diazines, and producing local concentrated heating only of the improperly printed characters to be erased and not of the properly printed characters by applying a stream of hot air over said characters to be erased, so that the erasure of said improperly printed characters is effected leaving said properly printed characters intact.

4,188,140

WELDED JOINT

Kurt Clemens, Gummersbach, Fed. Rep. of Germany, and Hans Klein, deceased, late of Gummersbach, Fed. Rep. of Germany (by Maria Klein nee Frielingsdorf, heir), assignors to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

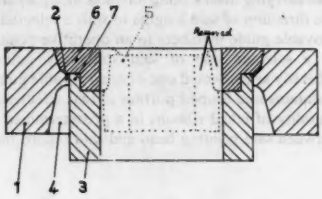
Filed Mar. 8, 1978, Ser. No. 884,593

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1977, 2710201

Int. Cl.[2] B25G *3/00*

U.S. Cl. 403—13 **2 Claims**

1. A welded joint between the end of a tube and a wall, comprising: a wall having an opening with a radial, circumferential lip between the inner and outer surfaces of said wall to provide circumferential recesses between said lip and the opposite surfaces of said wall, the outer end of said tube fitting in said lip with its end terminating at the edge of said lip, said end of said tube having a circumferential, internal recess to provide a thin lip on the end of said tube fitting in said lip on said wall,



said lip on said tube being of greater length axially than the width of said lip on the wall, welding material filling the space in said opening formed by the recess in the end of said tube and the recess in said wall beyond said tube, said welding material having an interior surface forming a continuation of the interior surface of said tube, the tube being spaced from said wall on the other side of the lip on the wall.

4,188,141

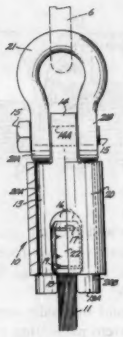
BUTT HOOK FOR A LOGGING CHOKER LINE

Robert C. Stoot, 3609 E. 17th Ave., Eugene, Oreg. 97403

Filed Aug. 8, 1978, Ser. No. 932,030

Int. Cl.[2] F16D *1/12*

U.S. Cl. 403—24 **4 Claims**



1. A butt hook for reception of a choker line ferrule, said butt hook serving to couple the log engaged choker line to a winch retrieved line, said butt hook comprising,

a main body defining a laterally opening cavity for reception of the choker line ferrule, said main body also defining a radially directed opening at one end for lateral passage of that portion of the choker line adjacent the ferrule,

a sleeve on said main body and adapted for limited axial movement therealong to open and close said cavity,

shackle means removably attached to the remaining end of said main body and adapted to receive the winch retrieved line, said shackle means having aligned ends proximate a sleeve end and normally preventing cavity opening movement of said sleeve in one direction,

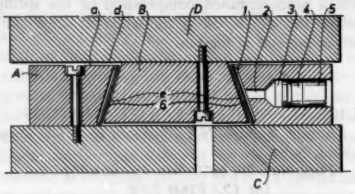
said main body restricting sleeve movement in an opposite direction, and

said sleeve axially positionable upon removal of said shackle means from said body to provide ingress and egress of the ferrule.

4,188,142
LOCKABLE SWIVEL COUPLING

Hans O. Olsson, Krondikesvagen 42B, Ostersund, Sweden (831 00)

Filed Nov. 1, 1978, Ser. No. 956,729
Claims priority, application Sweden, Nov. 9, 1977, 77126480
Int. Cl.[2] F16D 3/80
U.S. Cl. 403—31 6 Claims

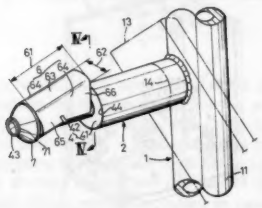


1. In a lockable swivel coupling comprising two machine elements, a journal means on one of the elements, a hole means in the other of the elements, receiving the journal means, the journal means and the hole means having rotational-symmetric complementary gliding surfaces forming a guide for swivelling motion between the two elements about a swivelling axis which also constitutes a common axis for the hole means and the journal means, and locking means for rigidly locking the elements in different swivelling positions, the improvement comprising: that the complementary gliding surfaces are conical along at least part of their axial extensions; that the journal means has an end surface cooperating with a complementary bottom surface in the hole means, the journal means being axially form-locked in the hole means with small axial clearance; and the locking means comprises an integral leak-proof working chamber behind at least one of said conical surfaces, the end surface and the bottom surface, the chamber having a flexible wall defining said one surface, the working chamber communicating with a hydraulic pressure source, whereby a hydraulic pressurization of the chamber causes a rigid locking of the elements against swivelling relative to each other with retained angular attitude and a precise axial positioning of the elements relative to each other.

4,188,143
DEVICE FOR RETAINING SCAFFOLD MEMBER

Norio Matsuura, 10-16 Minoo 6 chome, Minoo City, Osaka 562, Japan

Filed Aug. 11, 1978, Ser. No. 933,057
Claims priority, application Japan, Apr. 5, 1978, 53/40562
Int. Cl.[2] E04G 7/00
U.S. Cl. 403—49 4 Claims

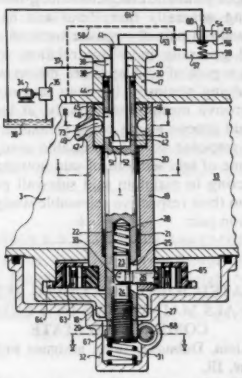


1. A device for retaining a scaffold member comprising:
a main body including a rod portion and a mounting pin extending from the forward end of the rod portion and having a circular section of a smaller diameter than the rod portion,
a retractable pivotable member rotatably fitting over and covering the mounting pin, the pivotable member including a semicircular curved portion having approximately the same length as the mounting pin, an annular portion integral with the forward end of the curved portion and loosely fitting around the mounting pin and a pair of parallel side plates extending from the opposite sides of the curved portion with the pin interposed between the side plates, and
an abutment provided at the forward end of the mounting pin for preventing the pivotable member from slipping off the pin.

4,188,144
MECHANISM FOR HOLDING AND GUIDING A PIVOTING MEMBER

Klaus-Jürgen Peters, Affalterbach; Hermann Nusser, Asperg, and Manfred Knetsch, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 18, 1977, Ser. No. 816,841
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1976, 2637467
Int. Cl.[2] F16B 7/10; F16D 1/12
U.S. Cl. 403—104 9 Claims



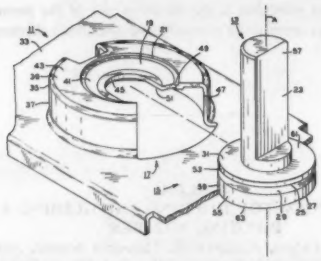
1. A mechanism for holding and axially locating a pivoting member on a shaft, comprising:
said shaft having a blind axial bore provided with partial internal threads and a radial channel communicating with said blind bore;
a hub surrounding said shaft coaxially and carrying said pivoting member, said hub having locating means extending through said radial channel into said blind bore in said shaft;
guide means, disposed on either side of said locating means in said blind bore in said shaft and capable of axial motion therein and disposed to engage and hold said locating means and said hub in a given axial position with respect to said shaft; and
an externally threaded adjustment screw disposed to engage said internal threads of said blind bore in said shaft and to bear against one of said guide means to thereby limit the excursion thereof in one axial direction of said bore and a spring disposed in said blind bore to bear against to the other of said guide means to limit the axial excursion thereof in the opposite axial direction.

4,188,145

ASSEMBLY AND METHOD OF ASSEMBLING

Ronald W. Poling, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Jun. 5, 1978, Ser. No. 912,224
Int. Cl.[2] F16B *9/00*
U.S. Cl. 403—112 **21 Claims**



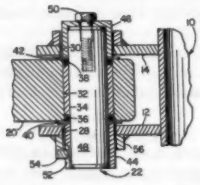
10. An assembly adapted for use in a condition responsive mechanism and comprising a housing part adapted for association with the condition responsive mechanism, aperture means in said housing part, a control device rotatably mounted at least in part in said aperture means and adapted for selecting a set temperature of the condition responsive mechanism, said control device including a body formed of a resin material and having a resilient yieldable characteristic, groove means in said body extending generally thereabout and having a pair of opposed sidewalls, a pair of opposite sections on said housing part arranged generally in off-set relation with each other about at least a part of said aperture means and disposed in releasable wedging abutment between said opposed sidewall pair of said groove means, respectively, at least one of said sidewalls of said groove means being yieldable with respect to said body in response to the releasable wedging abutment therewith of one of said sections of said housing part to establish a force acting to maintain said sidewall pair against displacement from their respective releasable wedging abutments with said section pair.

4,188,146

ARTICULATED JOINT INCLUDING BELLEVILLE SPRING SEALS MAINTAINED IN A PRESELECTED COMPRESSED STATE

Gary L. Stecklein, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Mar. 15, 1979, Ser. No. 20,578
Int. Cl.[2] F16C *11/00*
U.S. Cl. 403—158 **3 Claims**



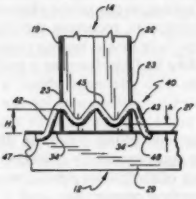
1. In an articulated connection between first and second members, the first member including a pair of parallel portions disposed on opposite sides of and pivotally interconnected to the second member by a pivot pin assembly including aligned holes located in the pair of parallel portions and the second member, a bushing press fit into the hole in the second member and receiving a pin extending into the holes in the pair of parallel portions, and first and second paris of Belleville springs respectively located against opposite ends of the bushing, the improvement comprising: said pin having a head at one end thereof located in the hole of a first one of the pair of parallel portions; a cap received on a second end of the pin and located in the hole of a second one of the pair of parallel portions; a cap screw releasably securing the cap tight against said second end of the pin; and the distance between the head and the cap bearing such predetermined relationship to the combined length of the bushing and uncompressed Belleville springs that a predetermined compression of the springs is effected when the cap screw is tightened to draw the cap against the second end of the pin.

4,188,147

QUICK SET CLIP FOR PARTITION STUDS

Wesley T. Murphy, Auburn, N.Y., assignor to E.T.I. Corporation, Auburn, N.Y.

Filed Nov. 29, 1978, Ser. No. 964,741
Int. Cl.[2] F16B *7/04*
U.S. Cl. 403—230 **9 Claims**



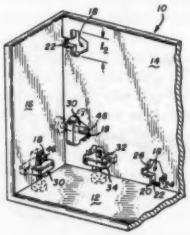
1. A clip for fastening metallic studding in place upon metallic runners, the clip including a single piece of high strength resilient material which lies within a single plane, the clip having two legs that are inclined within the plane and which slope towards each other from their respective distal ends toward their respective proximal ends, a sinusoidal shaped section cojoining the proximal ends of the legs, and extended locking keys depending outwardly from the distal end of said legs wherein the peaks and the valleys of said sinusoidal section are positioned a predetermined height above the top surface of said keys.

4,188,148

FASTENER ASSEMBLY

Helmut K. Waibel, Hayward, Calif., assignor to Durango Systems, Inc., San Jose, Calif.

Filed Sep. 20, 1978, Ser. No. 943,787
Int. Cl.[2] B25G *3/00*; F16B *5/00*
U.S. Cl. 403—258 **8 Claims**



1. Faster assembly for mounting and securing two structural members in abutting relationship with each other, comprising:

a unitary planar anchor member having opposing parallel planar surfaces with the outer edges configured to form a main leg portion and a reverse C-shaped portion, the outer

edge of said C-shaped portion further forming a top edge cross surface and a bottom edge cross surface intersecting the edge of the main leg portion to form a substantially P-shaped planar configuration, said top edge cross surface further forming a groove of a selected width;

a first planar structural member having a pair of opposing parallel planar surfaces with a composite notch therein, said notch being configured to include a pair of perpendicular intersecting slots forming a substantial T-shaped pattern with the cross member slot of said T-shaped notch extending parallel to the edge of the structural member and the leg slot of said T-shaped notch intersecting the edge of the structural member, the length of said cross member slot being less than the length of said main leg portion of the planar anchor member and at least equal to the distance between the points of intersection of said main leg portion and said reverse C-shaped portion of the planar anchor member and the depth of the structural member at the cross member slot being substantially equal to said selected width; the planar anchor member being press-fit into said cross member slot with the planes of the anchor being perpendicular to the plane of structural member about the notch and with a side edge surface of said main leg portion in abutment with the planar surface of the first structural member and said groove and said bottom edge surfaces of the reversed C-portion in abutment with the interior terminal edge surfaces of said cross member slot; and

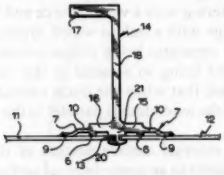
a locking pin engaging a second structural member and said anchor member with means for locking the pin to the anchor member.

4,188,149

SKIN WELDED JOINT

Laurence W. Gray, Amherstview, Canada, assignor to Canadair Limited, Montreal, Canada

Filed Apr. 14, 1978, Ser. No. 896,388
Claims priority, application Canada, Jan. 13, 1978, 294944
Int. Cl.[2] F16B *5/08*
U.S. Cl. 403—271 **10 Claims**



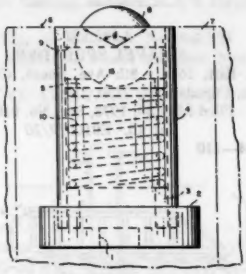
1. A skin welded joint comprising a thin metallic skin, a metallic frame member securable in contact with one face of said thin metallic skin and including a main body portion, at least one rib portion, and at least one flange portion, said rib portion projecting from one side of said main body portion and operatively abutting against said one face of the thin metallic skin, and said flange portion including an outer edge portion operatively contacting said one face of the thin metallic skin and being welded thereto, and an inner portion extending intermediate said outer edge portion and said rib portion, operatively spaced from said one face of the metallic skin, having a smaller thickness than said main body portion and being readily deformable under the heat of welding.

4,188,150

HIGHWAY LANE MARKER

Edward A. Sroka, 79 Lexington St., Waltham, Mass. 02154

Filed Jul. 13, 1978, Ser. No. 924,143
Int. Cl.[2] E01F *9/00*
U.S. Cl. 404—11 **8 Claims**



1. A marker to be embedded substantially below the grade of a roadway and having a portion projecting above the grade, said marker comprising:

a housing;

a substantially spherical member resiliently and rotatably supported in said housing;

cap means for retaining a major portion of said spherical member within said housing while permitting a portion of said spherical member to project from said housing;

support means for supporting said spherical member within said housing so that said spherical member can rotate within said housing when the portion of said spherical member that projects from said housing receives an impact parallel to the roadway; and

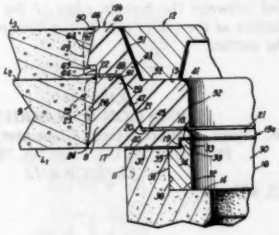
means for resiliently supporting said support means and said spherical member to allow axial movement of said support means and said spherical member within said housing.

4,188,151

MANHOLE EXTENSION ASSEMBLY

John R. Hall, Atlanta, Ga., assignor to Margaret T. Hall, Atlanta, Ga. and James B. Turner, Jr., Raleigh, N.C.

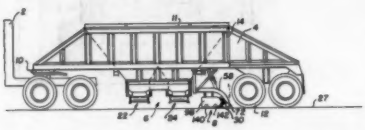
Continuation-in-part of Ser. No. 844,649, Oct. 25, 1977. This application Mar. 30, 1978, Ser. No. 891,715
Int. Cl.[2] E02D *29/14*
U.S. Cl. 404—26 **14 Claims**



1. A manhole extension assembly comprising in combination with a manhole cover and a manhole having a top ring embedded in pavement of a plastic extender ring member having a bottom surface mounted in concentric relationship on the upper end portion of said top ring of said manhole below pavement level, said ring member having an upper surface which has an annular recessed seat therein for receiving and seating said manhole cover with its upper level at about the

level of said pavement, said ring member having circumferentially spaced peripheral outwardly opening recesses which receive the pavement therein to prevent appreciable rotation of said ring member and for overlapping of a portion of said ring member below the upper surface of said ring member to prevent appreciable upward movement of said ring member.

4,188,152
GRAVEL SPREADER
Edward A. Kitt, 1604 - 8th Ave. South, Cranbrook, British Columbia, Canada (V1C 2L4)
Filed May 30, 1978, Ser. No. 910,983
Int. Cl.[2] E01C *19/20*
U.S. Cl. 404—110 **12 Claims**



1. An apparatus for spreading loose material, such as gravel, onto a surface, comprising:

a trailer with at least one hopper for the material, a set of wheels near a rear end thereof and means for pivotally connecting the trailer to a tractor near a front end thereof;

an endless belt conveyor mounted below the hopper for distributing the material onto the surface to one side of the trailer;

a frame connected to the trailer beneath the trailer and extending rearwardly from near the conveyor;

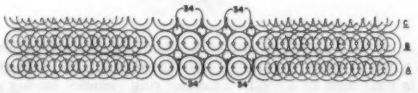
an elongate spreader connected to the frame for positioning generally parallel to the surface a distance above at least a portion of the surface, the spreader being between the conveyor and the rear wheels of the trailer and having a bottom edge, a top, a front and a back and extending laterally from the trailer for spreading the material to the one side of the trailer;

a first material retainer connected to the spreader at an end thereof distal the trailer and extending generally forwardly from the front of the spreader;

a second material retainer connected to the frame, being spaced-apart from the first retainer and extending forwardly from near the front of the spreader; and

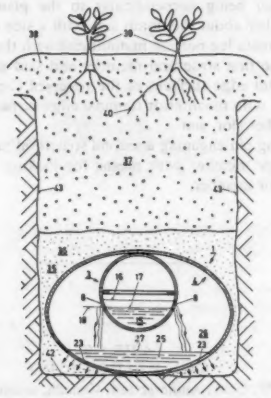
means for positioning the first retainer and the second retainer a distance apart along the spreader so that, when the material is distributed from the hopper, the material is spread between the first retainer and the second retainer and between the bottom edge of the spreader and the surface as the trailer moves in a forward direction along the surface.

4,188,153
FORMATION OF BARRIERS
John E. Taylor, "Telford", Over, Gloucester, England
Filed Mar. 28, 1977, Ser. No. 782,052
Int. Cl.[2] E02B *3/12*
U.S. Cl. 405—34 **2 Claims**



1. A method of ground surface stabilization, comprising cutting holes through the tread portion of motor vehicle tyres, stacking the tyres to form a barrier, commencing with a base layer of tyres disposed edge to edge in rows transverse to the length of the barrier and superposing layers of tyres in rows in register with the rows of the base layer but offset to make a staggered formation in which each tyre laps two overlying tyres and two underlying tyres and securing together the tyres of superposed rows, and securing the tyres together and to the subjacent ground, the barrier thus formed being a stable cellular structure to be filled with earth, silt or driven sand.

4,188,154
APPARATUS FOR WATERING AND DRAINING SOIL
James P. Izatt, North Vancouver, Canada, assignor to Cellsystem AG, Oftringen, Switzerland
Filed Aug. 21, 1978, Ser. No. 935,484
Claims priority, application Switzerland, Aug. 23, 1977, 10298/77
Int. Cl.[2] E02B *11/00, 13/00*
U.S. Cl. 405—43 **9 Claims**



1. Apparatus by which an area of soil can be selectively and alternatively watered and drained, said apparatus being of the type comprising an outer duct and an inner duct that extends lengthwise withing the outer duct, said inner duct being connectable for watering with a water source and being communicable for drainage with a sink to which drainage water can be conducted, said apparatus being characterized by:

A. the inner duct being so secured to the outer duct, in the interior thereof, that when the ducts extend horizontally

(1) the axis of the inner duct is parallel to the axis of the outer duct, and

(2) an upper external surface portion of the inner duct is closely adjacent to an upper internal surface portion of the outer duct;

B. the inner duct

(1) being substantially stiff so as to resist deformation in cross section, and

(2) having ports through its wall, at intervals along its length, that are at a level between its top and its bottom, but being otherwise substantially imperforate; and

C. the outer duct

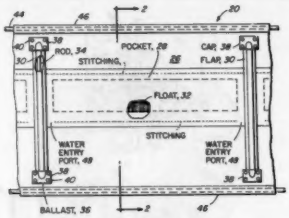
(1) being substantially larger in cross section than the inner duct and sufficiently stiff to maintain a substantially large space in the outer duct that is below the level of said ports, and

(2) the outer duct having ports through its wall that are spaced along its length and are at a level near its bottom but being otherwise substantially imperforate.

4,188,155
CONTAINMENT BOOM

P. Hillel Langermann, 86 Greenough St., Brookline, Mass. 02146

Filed Aug. 8, 1978, Ser. No. 931,965
Int. Cl.[2] E02B 15/04
U.S. Cl. 405—63 11 Claims



1. A boom for the containment of material floating on the surface of a liquid comprising:

a curtain having a pocket attached thereto;

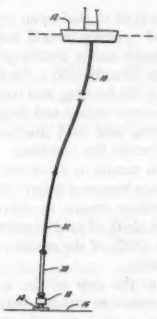
means for floating said curtain on said surface;

said pocket having a port permitting a quantity of said liquid to flow into said pocket in response to hydrostatic forces of said liquid in which said boom is to be floated, the size of said port being much smaller than the size of said pocket to provide an egress time of said quantity of said liquid which is much longer than the duration of an impact of a wave of said liquid upon said boom, said quantity of liquid being essentially entrapped in said pocket under the dynamic conditions of motion of said liquid thereby increasing the effective mass of said boom for resisting said liquid motion.

4,188,156
RISER

Edmund A. Fisher, and Emanuel Schnitzer, both of Houston, Tex., assignors to Cameron Iron Works, Inc., Houston, Tex.

Filed Jun. 1, 1978, Ser. No. 911,678
Int. Cl.[2] E21B 17/00
U.S. Cl. 405—195 6 Claims



1. A riser adapted to extend from a subsea wellhead to a structure at the water surface comprising

a lower section having means for connecting to the subsea wellhead, and

an upper tubular section having means for connecting to the lower section and to the surface structure,

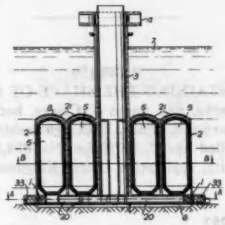
said lower section having a smaller cross sectional area at its upper end whereby it has an increased flexibility at its upper end as compared with its lower end,

the upper end of said lower section being of a less rigid material than the upper section whereby it has a greater flexibility than said upper section whereby a substantially longer life expectancy of the riser is achieved.

4,188,157
MARINE STRUCTURE

Kjell Vigander, Jar, Norway, assignor to A/S Høyer-Ellefsen, Oslo, Norway

Filed Mar. 13, 1978, Ser. No. 885,974
Claims priority, application United Kingdom, Mar. 15, 1977, 10897/77
Int. Cl.[2] E02B 17/00; F17C 1/12
U.S. Cl. 405—210 8 Claims

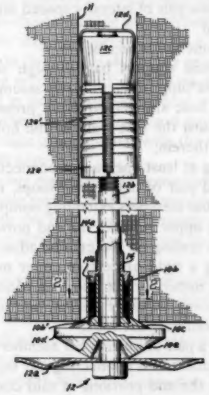


1. An offshore structure for handling of cryogenic fluids, such as liquefied natural gas, comprising a lower section of concrete and an upper section projecting up from the lower section above the sea level to support a deck superstructure, the lower section being formed of a plurality of cells, at least one of said cells housing an insulated tank for storage of low temperature fluids, the insulated tank housed by said at least one cell being completely submerged in operation and being rigidly supported by said at least one cell, said storage tank also comprising at least a primary and secondary barrier with insulation associated therewith, and said offshore structure further comprising an access tunnel system providing communication between the storage tank and the deck superstructure.

4,188,158
MINE ROOF BOLT HOLE SEAL

David C. Donan, Jr., and David M. Donan, both of Manitou, Ky., assignors to Waiamea Company, Inc., Manitou, Ky.

Filed May 15, 1978, Ser. No. 905,648
Int. Cl.[2] E21D 21/00
U.S. Cl. 405—259 6 Claims



1. In combination with a roof bolt assembly including a roof

bolt having a shaft, a roof bolt base plate, and a roof bolt expansion shell in selective engagement with a roof bolt hole drilled in a mine roof, an integral seal surrounding said roof bolt shaft comprising a first portion extending within said roof bolt hole, a second portion extending around the opening to said roof bolt hole in a selective sealing relationship, and a third portion compressed between said roof bolt base plate and said mine roof in an installed position, said first portion having a desiccant receiving cavity therewithin surrounding said roof bolt shaft, and closure means mounted on said shaft of said roof bolt covering said cavity in said first portion and selectively separated from said first portion at said installed position.

4,188,159

MAINTAINING THE SHAPE OF HOLES

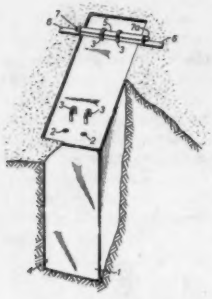
Stanley W. Clarke, and Angus J. Clarke, both of 2 High St., Weston Underwood, Olney, Buckinghamshire, England

Filed Apr. 7, 1978, Ser. No. 894,533

Claims priority, application United Kingdom, Apr. 13, 1977, 15345/77

Int. Cl.[2] E21D *11/00*

U.S. Cl. 405—282 **4 Claims**



1. A method for maintaining the shape of a hole dug in the ground, such as a grave, comprising the steps of

(a) introducing a normally-deflated inflatable support bag into the hole, said support bag having a configuration generally conforming to the configuration of the hole and including on its upper surface

(1) at least one pair of laterally spaced integral connecting loops, and

(2) at least one valve means;

(b) inflating said support bag through said valve means whereby said support bag initially assumes the configuration of the hole and subsequently presses in contiguous relation against the side walls of the hole to thereby become fixed therein;

(c) introducing at least one pair of connecting bar members through said pair of connecting loops, respectively, said connecting bar members extending completely across said support bag upper surface, the end portions of said connecting bars resting on the ground adjacent the hole;

(d) positioning a rigid protective cover member over said support bag upper surface and said connecting bar members, said cover member resting on the surface of the ground surrounding the hole;

(e) positioning a pair of locking bar members over said cover member adjacent said connecting bar members; and

(f) connecting the end portions of said connecting bar and locking bar members, respectively, to anchor said cover member to said support bag.

4,188,160

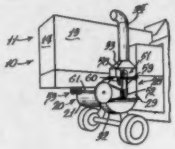
FEED RESIDUE SAVER FOR COMBINES

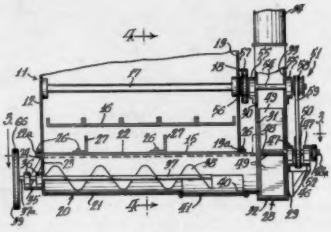
Wendell E. Corbett, Box 711, and Jay D. Sutton, 323 First Ave., S.W., both of Watertown, S. Dak. 57201

Continuation-in-part of Ser. No. 772,002, Feb. 25, 1977, abandoned. This application Nov. 21, 1977, Ser. No. 853,562

Int. Cl.[2] B65G *53/04*

U.S. Cl. 406—58 **8 Claims**





1. A feed residue saver attachment for a combine which has a casing with sidewalls, and a chaffer screen in said casing, said attachment comprising:

a trough adapted to be detachably mounted in a transverse position beneath the rearward portion of a combine to receive residue from the chaffer screen which is usable for animal feed, and which the combine would otherwise discharge onto the ground, said trough having a rearward side and a forward side, an end plate on the trough adapted to extend downwardly from one sidewall of the casing, and the trough having an open end adapted to be adjacent the other sidewall;

conveyor means in the trough for moving residue toward said open end;

an impeller housing secured to said open end of the trough, there being an infeed opening in said housing to receive residue from the trough and a discharge opening in the housing which opens directly into a discharge duct;

an impeller journalled in the housing and rotatable to receive residue from the conveyor means and discharge it through said discharge opening and said discharge duct into a residue container adjacent the combine;

first power transmission means to drive the impeller from a driven shaft of the combine at a relatively high speed;

second power transmission means to drive the conveyor means from a driven shaft of said combine at a speed to deliver substantially 100% of the residue received by the trough into the impeller;

and a deflector plate at the rear of the trough extending upwardly into the combine casing behind the chaffer screen so as to direct residue carried off the rear of said screen downwardly into the trough.

4,188,161

MILLING CUTTER WITH INSET CUTTING BLADES

Jean Cuilleron, 57 rue Francisque Voytier 42100, Saint-Etienne-Loire, France

Filed Feb. 21, 1978, Ser. No. 880,002

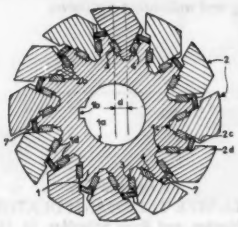
Claims priority, application France, Feb. 22, 1977, 77 06006

Int. Cl.[2] B26D *1/12*

U.S. Cl. 407—25 **11 Claims**

1. A milling cutter comprising a cylindrical body having a

bore adapted for receiving a driving shaft in coupled relation, said body having a periphery with uniformly distributed trapezoidal cavities therein, cutting blades with teeth thereon and base sections of trapezoidal shape corresponding to said cavities and insertable therein in two different positions, one being an endless screw position in which the periphery of said teeth of blades are inscribed in a circle concentric with the axis of the body and the other being a spur position in which the tips of the teeth are inscribed in a circle concentric with the axis of the



body, said base sections of trapezoidal shape of the blades having inclined, radial surfaces facing respective inclined side surfaces of the trapezoidally shaped cavities in said body, at least one of said pair of surfaces being provided with longitudinal groove means, an axial key engaged in said groove means to lock the respective blade in the cavity radially in either of said positions, and means on said body for engaging the blades at an intermediate location along the axial length thereof for securing the blades axially in both of said positions thereof.

4,188,162

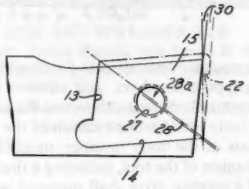
INDEXABLE INSERT DRILL

Raymond T. Zweekly, Royal Oak, Mich., assignor to The Valeron Corporation, Oak Park, Mich.

Filed Dec. 27, 1977, Ser. No. 864,627

Int. Cl.[2] B23B *29/03;* **B26D** *1/00, 1/12;* **B23B** *51/00*

U.S. Cl. 408—199 **13 Claims**



1. A replaceable insert drill comprising a shank having a center axis and a cutting insert end, a pocket at said insert end for locating a replaceable cutting insert, said pocket having a bottom insert face seating surface and side wall location for said insert, said seating surface extending to a radial extremity of said insert end on one side and substantially beyond the center axis of said drill on the other side, a parallelogram shaped cutting insert having a bottom seating face and a top face located in said pocket with an acute radially outermost axially leading cutting corner positioned to provide axial workpiece cutting clearance and negative axial lead, said insert having a slanting progressively deepening recess extending along the leading edge of its top face providing a cutting edge extending continuously in a notch interrupted straight line from said cutting corner at the outer face through or slightly under and substantially beyond the axis of said drill, and said notch comprising a chip interrupting notch in said cutting edge wherein said notch has a radially outermost non-cutting side which extends in a line substantially parallel to a designed axial direction of feed for said insert and a radially inwardly extending cutting side for leaving a substantial shoulder in the workpiece serving to stabilize the drill against vibration and drift upon axial drillentry into the workpiece.

4,188,163

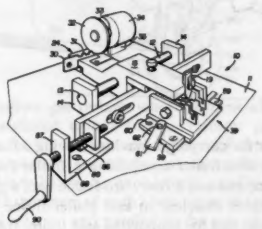
KEY DUPLICATING MACHINE

John Juskevic, c/o Penne Products Corporation, 18454 Fitzpatrick, Detroit, Mich. 48228

Filed Jul. 21, 1978, Ser. No. 926,931

Int. Cl.[2] B23C *1/16*

U.S. Cl. 409—82 **4 Claims**



1. A key duplicating machine for cutting the shaped edge on a key blank, comprising:

a support base means upon which is mounted a horizontally arranged, fixed shaft;

a lever having a central opening through which said shaft is journalled, with the lever being pivotable about the shaft axis and slidable longitudinally of the shaft axis;

a stylus mounted upon one end of the lever;

and an upwardly opening key blank vise mounted upon the opposite end of the lever, with said vise including means for temporarily clamping a key blank with its edge arranged parallel to the shaft axis;

mounting means supporting a fixed location, horizontally axised, rotating cutting wheel arranged in a plane transverse to the shaft axis and at a short distance above the vise;

guide means mounted upon said support base means and located adjacent the stylus, and having a shaped stylus contacted guide surface corresponding to a pre-determined key edge configuration;

said guide means comprising a number of similar, flat, guide blades clamped together in face to face relationship, with each having an exposed guide edge formed with a number of steps, each step corresponding to a pre-determined depth of cut on the key blank shaped edge;

said blanks being arranged with each blank having one of its steps selected in side by side alignment with the selected steps of the other blades to form said guide surface, with said guide surface being aligned with the stylus and parallel to the shaft axis;

releasable clamping means for clamping the blades together so that the guide surface may be changed in configuration by unclamping the blades and relatively moving each of them to utilize different steps thereof to form said guide surface;

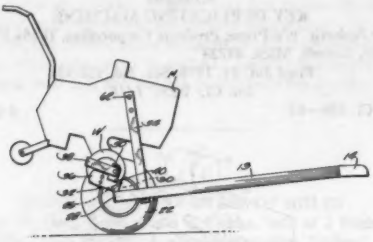
whereby said lever may be slid longitudinally of the shaft while the stylus contacts the guide surface to rock the lever about the shaft axis, to thereby move the key blank edge longitudinally beneath and towards and away from the wheel for thereby cutting the shaped edge on the key blank, and whereby different shapes may be cut upon key blank edges by pre-selecting the positions of each of the blades.

4,188,164

TOTE-TRAILER WITH WHEEL LOCKING DEVICE

Loren F. Hansen, Lincoln, Nebr., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed May 24, 1978, Ser. No. 909,278
Int. Cl.[2] B60P 3/00
U.S. Cl. 414—447 8 Claims



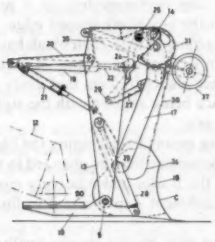
1. A trailer for carrying a machine having a frame supported by a wheel, said trailer comprising a trailer frame having a forward frame end and a rearward frame end, a ground engaging trailer wheel attached to said trailer frame adjacent said rearward frame end for supporting said trailer frame for movement on the ground and supporting said trailer frame for movement between a generally vertical position and a generally horizontal position, first means for supporting the machine on said frame in a position entirely off the ground when said trailer frame is in the generally horizontal position, second means for supporting the machine wheel connected to said trailer frame adjacent said trailer wheel, and a pivotable locking arm supported by said frame for releasably restraining the machine wheel on said wheel supporting means, said pivotable locking arm being movable between a first position wherein the machine wheel is restrained against said wheel supporting means and a second position spaced from the first position.

4,188,165

LOADERS FOR USE IN TUNNELS

Rolf C. Böhme, Johannesburg, and Dieter G. Lück, Kyalami Ext. 1, both of South Africa, assignors to General Mining and Finance Corporation Limited, South Africa

Filed Sep. 29, 1977, Ser. No. 838,111
Claims priority, application South Africa, Oct. 1, 1976, 76/5915
Int. Cl.[2] E02F 3/00
U.S. Cl. 414—694 9 Claims



1. A loader comprising:

a base;

a yoke extending above the base and having uprights spaced apart at their top ends by a cross-member between the uprights;

a shaft between the uprights;

a dipper arm swinging from the shaft to move to either side of the yoke between the uprights and below the shaft;

means to cause the dipper arm to swing between a loading position at a first side of the yoke and an unloading position at the opposite second side of the yoke;

a bucket pivoted to the free end of the dipper arm about a first axis parallel to the shaft; and

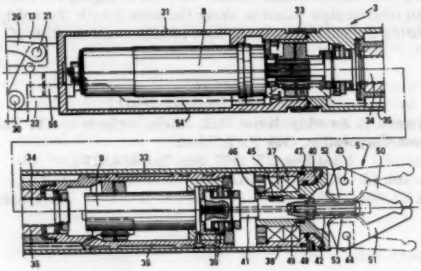
means to rotate the bucket about its pivot axis from a digging attitude to a load retaining attitude whereby the bucket is below the horizontal plane containing the dipper shaft during the loading and unloading positions.

4,188,166

SMALL SIZE TELEMANIPULATOR

Claude Moreau, Nantes, and René Schréder, St. Herblain, both of France, assignors to Ateliers et Chantiers de Bretagne-A.C.B., Nantes, France

Filed May 19, 1977, Ser. No. 798,478
Claims priority, application France, May 24, 1976, 76 15701
Int. Cl.[2] B25J 3/00
U.S. Cl. 414—735 9 Claims



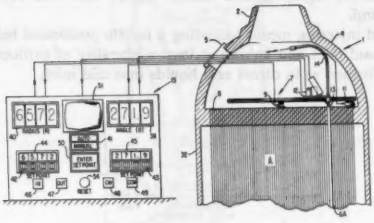
1. A telemanipulator arm element for mounting a gripping tool having gripping members, said element comprising an elongated body member; means to mount the tool adjacent to an end of the body member for rotation of the tool about the longitudinal axis of the body member; means to operate the gripping mechanism of the tool, including a first motor having a housing and a rotative drive shaft mounted within the body member, with said first motor housing secured against rotation with respect to the body member and said first motor drive shaft extending in substantial alignment with the longitudinal axis of the body member, and further including a slider and mechanical converting means for converting the rotation of the first motor drive shaft into linear movement of the slider in a direction generally parallel to the longitudinal axis of the body member and means for converting the slider movement into movement of said gripping members toward and away from one another; means to rotate the tool about the longitudinal axis of the body member, including a second motor having a housing and a rotative drive shaft mounted within the body member intermediate the first motor and the tool, with said second motor housing secured against rotation with respect to the body member and said second motor drive shaft extending in substantial alignment with the longitudinal axis of the body member; and nonrotative transmission line means for supplying driving power from an external source to said first and second motors.

4,188,167

APPARATUS FOR ALIGNING AN INSPECTION OR REPAIR DEVICE WITH A SELECTED TUBE IN A HEAT EXCHANGER

Gary E. Abell, Norton, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 7, 1978, Ser. No. 884,305
Int. Cl.[2] F28G 15/02
U.S. Cl. 414—744 8 Claims



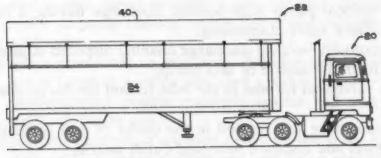
1. Apparatus for axially aligning an instrument guide with a selected one of a plurality of tubes in a heat exchanger having a flat circular tube sheet through which each of said plurality of tubes penetrates, comprising a beam, a fixed member supported on said tube sheet proximate the center thereof having an axis about which said beam is rotatable in a plane parallel to said tube sheet, a first servomotor operatively connected to said beam for angularly positioning said beam about said axis in clockwise and counterclockwise directions, a carriage having an instrument guide mounted on said beam, a second servomotor operatively connected to said carriage for radially moving said carriage toward and away from said axis, means operatively connected to said beam generating a first feedback signal proportional to the angular displacement of said instrument guide from a selected base radius and means operatively connected to said carriage generating a second feedback signal proportional to the radial displacement of said instrument guide from a predetermined radius.

4,188,168

BOW AND SPREADER BAR

William J. Brown, Lower Burrell, and James R. Rowley, Freeport, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 1, 1978, Ser. No. 911,598
Int. Cl.[2] B65G 67/24
U.S. Cl. 414—786 6 Claims



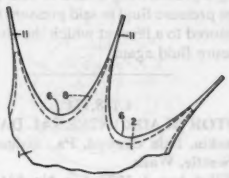
1. A method of loading a pack of sheets on frames mounted on bed of an open-top trailer, comprising the steps of:
mounting a pair of sheet slings in spaced relationship to one another on a rigid bar;
mounting the slings about ends of the pack;
lifting the bar containing the sheets to position the sheets on the frames;
removing the slings from the ends of the pack; and
mounting the bar to and between walls of the trailer to aid in maintaining the walls in spaced relationship to one another.

4,188,169

IMPELLER ELEMENT OR RADIAL INFLOW GAS TURBINE WHEEL

Jan Mowill, Daniel Barths vei 11, 3600 Kongsberg, Norway

Filed Aug. 9, 1977, Ser. No. 823,187
Claims priority, application Norway, Aug. 11, 1976, 762794
Int. Cl.[2] F01D 5/04
U.S. Cl. 416—185 4 Claims



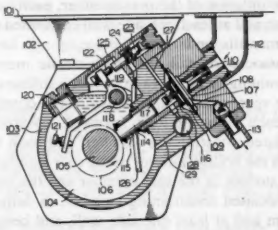
1. A radial inflow gas turbine wheel element adapted to be operatively associated with a turbine exducer portion, said wheel element having an axis and a plane of rotation, a hub portion, and a plurality of blades extending from said hub portion; each blade having an axial length, a radial length, and a thickness, said thickness of each blade taken in a plane normal to the plane of rotation and parallel to the axis of the element at any given radial station being generally uniform over substantially the entire axial length of said blade and said hub portion having an outer profile which is substantially parallel to the axis of rotation.

4,188,170

DIAPHRAGM PUMP

Jinichi Ito, Tokyo, Japan, assignor to Yamada Yuki Seizo Co., Ltd., Tokyo, Japan

Filed Apr. 13, 1978, Ser. No. 896,151
Claims priority, application Japan, May 2, 1977, 52-50940; Jul. 28, 1977, 52-90560
Int. Cl.[2] F04B 9/10
U.S. Cl. 417—387 4 Claims



2. A diaphragm pump comprising a diaphragm and having a pump chamber on one side of said diaphragm and a pressure fluid chamber on the other and a cylinder communicating with said pressure fluid chamber, a plunger reciprocally movable in said cylinder for raising and lowering the pressure of a pressure fluid in said pressure fluid chamber for deflecting said diaphragm in response to an increase or decrease in said pressure and causing said diaphragm to effect a pumping action on a pumped fluid in said pump chamber; driving means connected to said plunger for reciprocating said plunger; a pressure fluid reservoir; first means communicating the space within said cylinder and said pressure fluid chamber with said reservoir and having a pressure regulating valve for opening only when the pressure of the pressure fluid in said cylinder and said pressure fluid chamber exceeds a predetermined value during a pressurizing stroke of said plunger; further means communicating said space within said cylinder and said pressure fluid chamber with said reservoir and having a check valve means

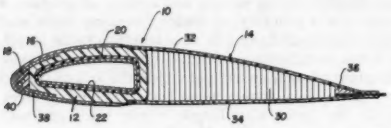
therein for opening or closing in response to the difference between the pressure of pressure fluid in said pressure fluid reservoir and the pressure of pressure fluid in said pressure fluid chamber and cylinder, said check valve means opening during a pressure reducing stroke of said plunger before the pressure of the pressure fluid in said cylinder and said pressure fluid chamber is lowered to a level at which the separation of air dissolved in said pressure fluid becomes vigorous, and closing during a pressurizing stroke of said plunger when the pressure of the pressure fluid in said pressure fluid chamber and cylinder is restored to a level at which the air begins dissolving into said pressure fluid again.

4,188,171

ROTOR BLADE INTERNAL DAMPER

Joseph M. Baskin, Bala Cynwyd, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Aug. 2, 1977, Ser. No. 821,070
Int. Cl.[2] B64C *27/46*
U.S. Cl. 416—226 **23 Claims**



1. An aerodynamic rotor blade comprising:

(a) an elongated structural spar member having an inner surface forming a hollow interior throughout its length and a contoured outer surface forming a leading edge portion and a spar heel portion which together define the chordwise limits of the spar member, and a tip end portion and a root end portion, which together define the spanwise limits of the spar member;

(b) an aft fairing structure attached to the spar member at the spar heel portion;

(c) at least one constraining member situated within the hollow interior of the spar member, each including a top, bottom and at least one side wall connected to the top and bottom walls; and

(d) as associated load absorbing elastic member for each constraining member, each having a stiffness less than that of the spar member and its associated constraining member, each being at least spanwise coextensive with its associated constraining member, and each being situated within the hollow interior of the spar member between the inner surface of the spar member and the outer surface of its associated constraining member, as defined by its top, bottom and at least one side wall, and being attached to said outer surface of its associated constraining member and to the inner surface of the spar member.

4,188,172

METHOD AND MEANS FOR INJECTING HOT LIQUID WHEN PUMPING COLD LIQUID

Sherwood G. Talbert; Thomas A. Klausing, both of Columbus, and Jan B. Yates, Reynoldsburg, all of Ohio, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 24, 1978, Ser. No. 909,312
Int. Cl.[2] F04B *39/00, 39/06*
U.S. Cl. 417—53 **3 Claims**

1. A pumping system for removing viscous liquids at substantially increased flow rates from tanks in vessels or at other sites to other storage or transfer means comprising:

pumping means including a suction pump immersed in said liquids for removing lowered viscosity liquids therefrom, said pump disposed in a substantially vertical attitude in said liquids and having an inlet at the lower end thereof;

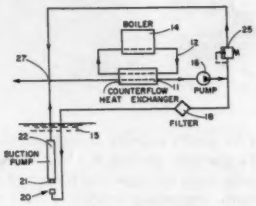
means remote from said liquids for heating and initiating flow of said liquids,

said remote means including a priming liquid, a boiler and a counterflow heat exchanger for transferring heat to said liquids,

said priming liquid substantially identical to said liquids to afford blending therewith;

means for injecting said heated liquids into said suction pump,

said injecting means including a nozzle positioned below said inlet and having at least a plurality of orifices so formed as to direct said liquids into said inlet,



said injecting means spaced from said pump to create an aspiration effect enhancing entry of said heated liquids into said inlet;

means coupling said pump to said boiler to return a portion of said liquids to said injecting means,

said means for initiating flow being a second pump and a filter connected in series between said counterflow heat exchanger and said nozzle; and

a relief valve connected in parallel across said second pump and said coupling means,

said pumping means further including a discharge line having a common connection with said suction pump, said relief valve and said heat exchanger.

4,188,173

VERTICAL PUMP WITH FREE FLOATING CHECK VALVE

Malcolm Lindsay, O'Hara Township, Allegheny County, Pa., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Oct. 6, 1976, Ser. No. 730,056
Int. Cl.[2] F04B *17/00*
U.S. Cl. 417—424 **3 Claims**

1. A vertical pump with bottom discharge having a free floating check valve comprising:

a substantially vertical discharge channel disposed adjacent to the outlet nozzle of said pump;

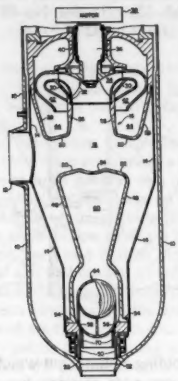
a first valve seat formed in the inlet to said discharge channel;

a second valve seat formed in the outlet of said discharge channel and disposed near said outlet nozzle;

a substantially spherical valve member disposed within said discharge channel for engaging said first valve seat under conditions of a reverse flow of coolant through said discharge channel thereby preventing reverse flow through said pump; and

a cage-like member with openings therein for the passage of said coolant attached to the underside of said spherical valve member for supporting said spherical valve member and holding said spherical valve member off said second valve seat to thereby allow said coolant to pass through said cage-like member and through said outlet nozzle, said spherical valve member together with said cage-like mem-

ber acting to prevent reverse flow through said discharge channel that might damage said pump while allowing



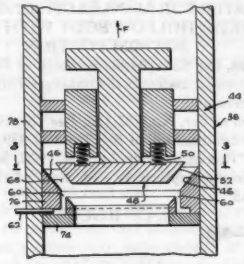
reverse and forward flows therethrough under conditions that will not damage said pump.

4,188,174

WEAR RESISTANT VALVE

Gerald S. Perkins, Altadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Sep. 2, 1977, Ser. No. 830,133
Int. Cl.[2] F04B *21/00, 39/00*
U.S. Cl. 417—432 **4 Claims**



1. A fluid pump system comprising:

a main pump which includes a main cylinder with an outlet, and a main piston movable in the cylinder towards said outlet to pump material which lies in said cylinder out of said outlet;

a valve connected to said main cylinder outlet, including walls forming a valve seat, and a valve member with a seat-engaging portion movable against and away from said valve seat; and

means for directing a washing fluid into the space between said valve member portion and said valve seat at a time immediately prior to closing of said valve member portion against said valve seat, including a washing fluid outlet positioned to direct a washing fluid into said space, a secondary pump which includes a secondary cylinder and a secondary piston movable in said secondary cylinder to pump washing fluid toward said washing fluid outlet, and means for coupling said main piston to said secondary piston only near the end of the stroke of said main piston as it approaches said outlet of said main cylinder, to then begin moving said secondary piston to pump said washing fluid.

4,188,175

FUEL INJECTION PUMPS FOR INTERNAL COMBUSTION ENGINES

Jean-Claude Bonin, Blois, France, assignor to CAV RotoDiesel, Blois, France

Filed Oct. 7, 1977, Ser. No. 840,419
Claims priority, application France, Oct. 11, 1976, 76 30446
Int. Cl.[2] F04B *19/02, 29/00*
U.S. Cl. 417—462 **4 Claims**

1. An injection pump for supplying fuel to an internal combustion engine, comprising:

a housing,

a rotor mounted for rotation within the housing and arranged to be driven in timed relationship with the engine,

a transverse bore formed in the rotor,

a pair of plungers slidably mounted in said bore,

a cam ring surrounding said rotor and formed with cam lobes on its internal periphery,

a pair of rollers engaging the internal periphery of the cam ring, and

roller shoes for respectively supporting said rollers, said roller shoes being respectively in engagement with the outer ends of the plungers, whereby, as the rotor rotates about its axis of rotation, an inward movement is imparted to the rollers,

the axis of the bore in which the plungers are mounted and the rotor's axis of rotation not intersecting with each other, whereby, the rollers are angularly spaced from each other, with respect to the rotor's axis of rotation, by an angle less than 180°,

the distance between the axis of the bore and the rotor's axis of rotation being such that upon rotation of the rotor about its axis of rotation the two rollers are simultaneously engaged and disengaged by pairs of cam lobes.

4,188,176

VARIABLE DISPLACEMENT ROTARY FLUID ENERGY CONVERTER

Earl W. Traut, 8040 Palm Lake Dr., Orlando, Fla. 32811

Filed Feb. 13, 1978, Ser. No. 877,326
Int. Cl.[2] F01C *1/02, 21/16;* **F03C** *3/00;* **F04C** *15/04*
U.S. Cl. 418—24 **3 Claims**

1. A variable displacement rotary fluid energy converter comprising:

a rotor,

said rotor being elongate and including a longitudinal slot,

a generally triangular chamber,

a crank,

said crank moving back and forth in said longitudinal slot as said rotor rotates end over end within said chamber,

a central plate,

said plate serving to close one end of said chamber and being free to move radially and not free to move axially,

said plate including an elongate hole shaped as the cross-section of said rotor and surrounding same,

said rotor being free to slide axially in said elongate hole,

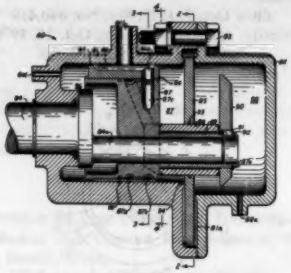
a ring,

the outer periphery of said ring being generally triangular as the cross-section of said chamber and located in same,

a disk,

said disk including a hole through which said crank passes,

said disk being free to rotate with said crank inside said ring, said disk including porting means to conduct fluid to and from said chamber and said longitudinal slot,



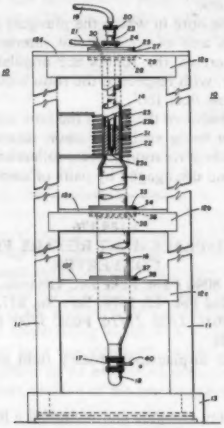
said disk and said ring serving to close the other end of said chamber and being free to slide axially with said rotor, so as to vary the displacement of said chamber per revolution of said rotor.

4,188,177

SYSTEM FOR FABRICATION OF SEMICONDUCTOR BODIES

Jack S. Kilby, Dallas; William R. McKee, Plano, and Wilbur A. Porter, College Station, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 7, 1977, Ser. No. 766,223
Int. Cl.[2] B29C *23/00*
U.S. Cl. 425—5 **9 Claims**



1. A system for fabricating small semiconductor bodies, which comprises:

(a) a capillary tube having heat transmissive properties for receiving a solid charge of semiconductor material and having a nozzle for discharging the semiconductor material;

(b) an outer tube enclosing said capillary tube;

(c) a heat susceptor internal to said outer tube and encircling said capillary tube;

(d) heating means for energizing said heat susceptor to render said charge molten; and

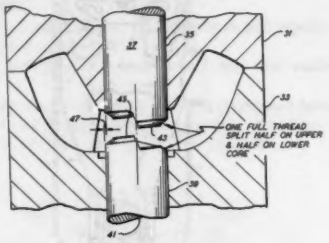
(e) means to pressurize said capillary to force said molten charge through said nozzle.

4,188,178

INTERNALLY THREADED PLASTIC NUT

Bernard Anscher, 21 Elm St., Woodbury, N.Y. 11797

Filed Feb. 28, 1978, Ser. No. 882,112
Int. Cl.[2] B29C *1/14*
U.S. Cl. 425—469 **2 Claims**



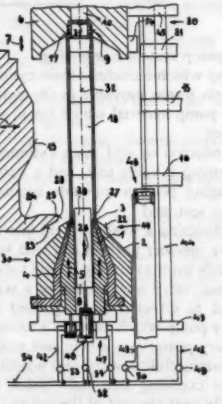
1. In a mold for molding a plastic nut which includes a mold cavity and at least one core member for molding internal threads in the nut, an improved core assembly comprising a first core member having on the end thereof only one-half thread and a second core member having on the end thereof only a second half-thread and shaped to mate with said first core member to form one single thread, said core members having their axes aligned and adapted to abut against each other during molding, whereby, a nut may be molded with a single thread therein using core members which can be simply, linearly inserted and removed from said mold cavity.

4,188,179

APPARATUS FOR MANUFACTURING A BLOWN SYNTHETIC HOLLOW BODY WITH A CLOSED BOTTOM PORTION

Gerhard Linss, and Karl Ossberger, both of Weissenburg, Fed. Rep. of Germany, assignors to Ossberger Turbinenfabrik, Fed. Rep. of Germany

Continuation of Ser. No. 752,126, Dec. 20, 1976, abandoned, which is a continuation of Ser. No. 582,939, Jun. 2, 1975, abandoned. This application Apr. 20, 1978, Ser. No. 898,171
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1974, 2426735
Int. Cl.[2] B29C *17/07*
U.S. Cl. 425—531 **2 Claims**



1. Apparatus for manufacturing a blown hollow body of a synthetic material, the hollow body having a head piece and a

closed bottom portion, the apparatus having a longitudinal axis, said apparatus comprising:

a discharge receiver device movable along said axis from a lowered position to a raised position having a recess forming the head piece, said recess being aligned along said axis;

a blow needle having a nipple on one end thereof, said needle being concentrically housed in said discharge receiver device along said axis with said nipple extending into said recess;

a multi-sectional blow form concentrically aligned along said axis, said blow form comprising a plurality of sections movable from an open position to a closed position, said blow form abutting said discharge receiver device in said raised position in its closed position thus defining a closed mold volume, each section having a bottom piece with a bottom surface, each said bottom piece extending transversely to said axis and having a cutting edge;

a ring nozzle extrusion means concentrically aligned along said axis for extruding a synthetic material comprising a nozzle cone and a nozzle mouthpiece concentrically surrounding said nozzle cone forming a ring-slotted jet orifice from which the synthetic material can be extruded, said orifice terminating in a frontal area of said nozzle mouthpiece, the cross-sectional area of said jet orifice taken on a plane perpendicular to said axis reducing towards said frontal area of said nozzle mouthpiece;

means for abutting said discharge receiver device against said extrusion means in said lowered position and for moving said discharge receiver along said axis from said lowered position to said raised position with respect to said extrusion means so that a parison is formed therebetween;

means for moving said multi-sectional blow form from said open to said closed position so that a surface of said frontal area inclined with respect to said axis annularly abuts corresponding inclines on said bottom surfaces of said blow form sections whereby said blow form is wedged between said extrusion means and said discharge receiver device in said raised position and defining an ingot butt forming hollow space which bridges said jet orifice, said bottom pieces in said closed position meeting to form said closed mold volume; and

means for moving said nozzle cone with respect to said nozzle mouthpiece upon closing of said blow form sections such that said nozzle cone and nozzle mouthpiece come into contact with each other only at the frontal area of said nozzle mouthpiece, a frontal end portion of said nozzle cone extending into said hollow space;

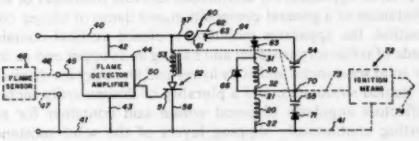
said hollow space being only large enough in a direction parallel to said axis such that said frontal end portion of said nozzle cone does not contact said bottom surfaces of said bottom pieces of said blow form sections.

4,188,180

FUEL BURNER SAFE STARTING SYSTEM

William B. Hamelink, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 2, 1977, Ser. No. 856,694
Int. Cl.² F23Q *9/08*
U.S. Cl. 431—46 **9 Claims**



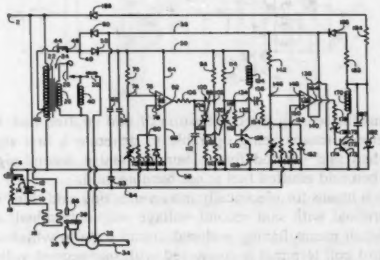
1. A fuel burner safe starting system, including: flame responsive switch means including a relay having a normally closed contact; said flame responsive switch means adapted to be energized from an alternating current source and to respond to a flame sensor to energize said relay upon said sensor detecting a flame; pilot valve means including coil means with said pilot valve means being capable of opening upon application of a full-wave alternating current voltage to said coil means, and remaining open upon the application of a one-half wave alternating current voltage to said coil means; main valve means including pressure responsive means and coil means with said main valve means being capable of opening upon the joint application of a fuel pressure to said pressure responsive means and a voltage to said main valve coil means; asymmetric current conducting means, said main valve coil means, and said pilot valve coil means forming a series circuit; and burner demand switch means connected to said series circuit and controllably connecting said series circuit across said alternating current source; said normally closed relay contacts connected in parallel with said asymmetric current conducting means and said main valve coil means to initially energize said pilot valve means upon said demand switch means closing thereby starting the operation of said system only upon said relay being initially deenergized.

4,188,181

GAS BURNER CONTROL SYSTEM

Dennis M. Rippelmeyer, Waterloo, Ill., and Robert L. Baysinger, St. Louis, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Apr. 24, 1978, Ser. No. 899,550
Int. Cl.² F23N *5/00*
U.S. Cl. 431—66 **9 Claims**



1. In a gas burner control system,

a burner;

an electrical resistance igniter for igniting said burner;

sensing means located in close proximity to said igniter and said burner; and

circuit means connected to said sensing means responsive to absence of current flow between said igniter and said sensing means when said igniter is below ignition temperature for effecting energizing of said igniter, and responsive to presence of current flow between said igniter and said sensing means when said igniter is above ignition temperature for effecting flow of gas to said burner, and responsive to presence of current flow between said sensing means and said burner when burner flame exists for maintaining gas flow to said burner.

4,188,182

METHOD AND APPARATUS FOR IGNITING AND REIGNITING COMBUSTIBLE FUEL

Edward M. Junak, Grand Junction, Colo., assignor to Teletronics Co., Inc. of Clifton, Clifton, Colo.

Filed Aug. 26, 1977, Ser. No. 828,195
Int. Cl.² F23H *5/02*
U.S. Cl. 431—80 **17 Claims**

1. Apparatus for igniting and reigniting combustible fuel emitted from pilot burner structure or the like, comprising:

electrically-conductive means through which said fuel is emitted from said pilot burner structure;

electrically-conductive probe means for positioning adjacent said pilot burner structure in the region in which said fuel is emitted;

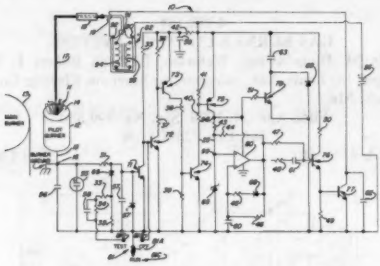
ignition coil means for generating ignition sparks, said coil means having a primary and secondary coil and three terminals, said secondary coil being connected between said first and second coil terminals, said primary coil being connected between said first and third coil terminals;

first means for connecting said probe means electrically with said second coil terminal;

power supply means for supplying a DC voltage, said power supply means having first and second voltage output terminals across which said DC supply voltage is generated;

second means for connecting said first voltage output terminal electrically with said first coil terminal;

third means for connecting said second voltage terminal electrically with said electrically-conductive means through which said fuel is emitted;



means for sensing the combustion of said emitted fuel, said sensing means being operable to generate a first signal when said emitted fuel is burning and a second signal when said emitted fuel is not burning; and,

switch means for electrically interconnecting said third coil terminal with said second voltage output terminal, said switch means having a closed circuit state in which said third coil terminal is connected with said second voltage output terminal and an open circuit state in which said third coil and voltage output terminals are disconnected from each other, said switch means being triggered by said first signal generated by said sensing means into said open circuit state whereby a substantially constant ion current flows through said primary coil and said burning emitted fuel, said switch means being responsive to said second signal generated by said sensing means to cycle at a predetermined rate between said closed and open circuit states whereby the electrical field in said primary coil periodically increases and collapses to generate ignition sparks between said probe means and electrically-conductive means through which said fuel is emitted thereby to ignite said emitted fuel.

4,188,183

BETTER USE OF GAS DISCHARGE ENERGY FOR SMOKE SUPPRESSION

John S. Zink; Robert D. Reed, and Robert E. Schwartz, all of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed Mar. 21, 1977, Ser. No. 779,595
Int. Cl.[2] F23D *15/00*
U.S. Cl. 431—202 **16 Claims**

1. Apparatus for improved use of gas discharge energy for smoke suppression, comprising:

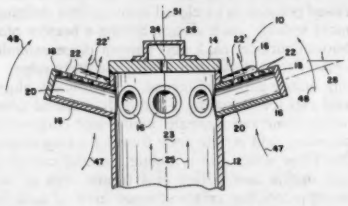
a plurality of horizontally spaced apart burner assemblies, each assembly comprising:

(a) a burner assembly having a vertical axis and a plurality of outwardly spaced tubular arms;

(b) a plurality of orifices in the top surfaces of said arms, the axes of said orifices directed upwardly in radial planes and inclined at a selected angle "A" to the axis of said burner;

(c) means to supply a combustible gas under selected pressure to each of said burner assemblies, and means to ignite said gas above said burner assemblies;

whereby, said gas will issue as high velocity jets from each of said orifices, and will entrain and aspirate air through the angular openings between said arms, and will turbulently mix said gas and air,



whereby said inclined jets of gas will intersect along the axis of said burner at a selected point above said burner, and will proceed as a single vertical jet of gas, air and flame; and

(d) each of said burner assemblies being spaced from each other, and from any confining structure,

whereby combustion air is free to flow upwardly along both sides of said arms to be freely aspirated into and turbulently mixed with the high velocity jets of gas issuing from said orifices.

4,188,184

CONTINUOUS PROCESSES AND EQUIPMENT FOR TREATMENT OF SOLID SUBSTANCES

Luigi Fornoni, Rua Dr. Mario Freire, 226, Sao Paulo, Brazil

Filed Nov. 21, 1977, Ser. No. 853,042
Claims priority, application Brazil, Apr. 13, 1977, 7702321[U]
Int. Cl.[2] F27B *15/00*
U.S. Cl. 432—13 **31 Claims**

1. In an apparatus for continuous thermal treatment of solid substances of a general composition and damp or clayey composition, the apparatus including a closed vertical container made of refractory material and having at its upper end an inlet for solid substances, and at its lower end an outlet for discharge of treated substances, and a plurality of downwardly inclined deflectors angularly disposed within said container for supporting continuously slipping layers of the solid substances moving downwardly under the action of gravity, the improvement which comprises said deflectors being spaced apart from each other at a predetermined distance, so as to define a free space under each deflector for accumulation of gases therein, and passageway means disposed in said deflectors, for inter-

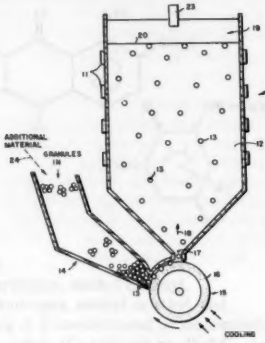
connecting one free space to another for passage of accumulated gases therebetween, and forming thereby an internal circuit for circulation of gases within said container.

4,188,185

METHOD AND APPARATUS FOR THE TREATMENT OF PARTICULATE MATERIALS

Nam P. Suh, Sudbury, and Salvatore C. Malguarnera, Medford, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Aug. 12, 1977, Ser. No. 824,246
Int. Cl.[2] F27B *15/00*
U.S. Cl. 432—27 **8 Claims**



1. A system for treating solid polymer plastic particulate material comprising means for containing a heated fluid medium comprising mercury having a density which differs from the density of said particulate material;

means for heating said mercury to at least about 200° C.;

means for introducing said particulate material in the form of solid granules at a temperature of about 20° C. into said heated fluid medium at the lower end thereof so that the particles of said particulate material travel upwardly therethrough to the upper end thereof and become sufficiently heated to reach a flowable state, the density differential between said particles and said fluid thereby causing said particles to leave said fluid and to coalesce and form a flowable mass thereof external to said fluid.

2. A method for treating solid particulate material comprising the steps of

providing a fluid medium having a density which differs from that of said particulate material;

heating said fluid medium to a temperature higher than that of said particulate material;

introducing particles of said particulate material into said heated fluid medium whereby said particles travel through said medium and become heated to a flowable state,

said particles coming to and remaining at a general state of rest near a surface of said fluid medium, a thin film of said fluid medium being present between said particles and said surface,

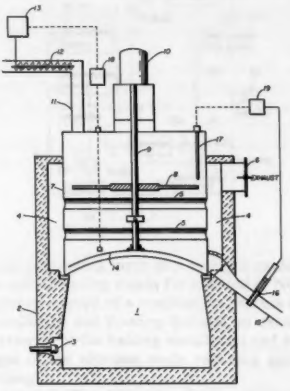
each of said flowable particles being permitted to leave said fluid medim when said thin film ruptures at a region adjacent thereto, the density differential between said particles and said fluid medium causing said particles upon leaving to form a flowable mass of particulate material into which said particles are thereby coalesced.

4,188,186

AUTOMATIC CALCINING KETTLE

Richard D. Ladwig, Salina, Kans., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jun. 22, 1978, Ser. No. 918,140
Int. Cl.[2] F27B *9/40*
U.S. Cl. 432—43 **5 Claims**



1. A control system for operating a gypsum calcining kettle in a continuous manner, including,

a furnace in which combustion supplies heat for calcining gypsum,

a kettle arranged in a heat exchange relationship with the products of combustion of the furnace combustion,

a supply of finely ground raw gypsum,

means connecting the supply to the kettle to control the gypsum supplied the kettle,

means for sensing the temperature of gypsum supplied and being calcined in the lower portion of the kettle,

a discharge conduit connected to the lower portion of the kettle,

a valve in the conduit,

and means of detecting the level of the calcining gypsum in the kettle and arranged to continuously operate the valve to adjust the position of the valve and regulate the flow of calcined gypsum from the lower portion of the kettle to maintain a level of the gypsum in the kettle within a predetermined range.

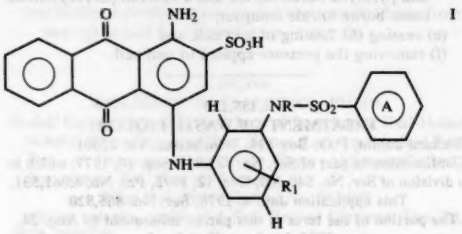
4,188,187

DYEING OF POLYAMIDE TEXTILES AND ANTHRAQUINONE DYESTUFFS THEREFOR

Roland Mislin, Saint-Louis, France, and Karl-Ulrich Steiner, Binningen, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Apr. 5, 1978, Ser. No. 893,730
Claims priority, application Switzerland, Apr. 6, 1977, 4357/77
Int. Cl.[2] C09B 1/00
U.S. Cl. 8—39 B 11 Claims

1. A process for dyeing or printing natural or synthetic polyamide textile substrates comprising employing, as dyestuff, a compound of formula I,



I

in which

R is hydrogen, methyl or ethyl,

R_1 is hydrogen, methyl or ethyl, and

the ring A is unsubstituted or monosubstituted by halogen, (C_{1-2})alkyl, (C_{1-2})alkoxy or alkyl(C_{1-2}) carbonylamino or disubstituted by methyl groups,

in free acid or salt form.

4,188,188

HIGH DENSITY LIPOPROTEIN CHOLESTEROL ASSAY

Howard Willner, San Anselmo, and Robert J. Kapteyn, Newport Beach, both of Calif., assignors to Bio-Rad Laboratories, Inc., Richmond, Calif.

Filed Sep. 27, 1978, Ser. No. 945,982
Int. Cl.[2] G01N 31/02, 33/16, 31/14
U.S. Cl. 23—230 B 11 Claims

1. A composition for use in a HDL cholesterol separation comprising heparin, a divalent cation salt having the formula: CX_2, wherein C is selected from the group consisting of Group IIA metals and manganese and X is a halogen, and an inert filler comprising a polysaccharide, a terminal interlocking linear glucose polymer and a vinylpyrrolidone polymer.

4,188,189

QUANTITATIVE TESTING FOR VITAMIN B_{12}

Robert H. Allen, Englewood, Colo., assignor to University Patents, Inc., Norwalk, Conn.

Filed Apr. 4, 1978, Ser. No. 893,524
Int. Cl.[2] G01N 33/16, 31/06
U.S. Cl. 23—230.3 6 Claims

1. A radioisotope dilution assay for measuring the vitamin B_{12} level in a sample comprising:

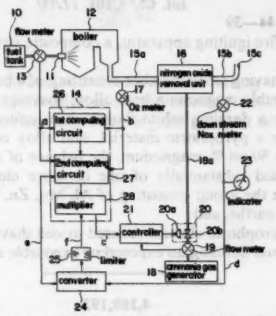
contacting said sample with a known amount of a radioisotope of vitamin B_{12} and a composition containing a binding protein substantially specific to vitamin B_{12}, said composition being substantially free of substances which bind vitamin B_{12} analogues.

4,188,190

INPUT CONTROL METHOD AND MEANS FOR NITROGEN OXIDE REMOVAL MEANS

Ryoji Muraki, Nishinomiya; Shinichiro Takemura, Osaka; Yoshio Ohashi, Tokyo, and Athushi Ichioka, Machida, all of Japan, assignors to Kurashiki Boseki Kabushiki Kaisha, Kurashiki and Tokyo Shibaura Electric Co. Ltd., Kawasaki, both of, Japan

Filed Dec. 6, 1976, Ser. No. 747,687
Claims priority, application Japan, Mar. 23, 1976, 51/30887; Jun. 17, 1976, 51/70404
Int. Cl.[2] G05D 11/02
U.S. Cl. 23—232 R 20 Claims



1. A method of controlling input of a nitrogen oxide reducing agent into a system having means for removal of NO_x from flue-gas produced as a result of a combustion process effected in a heating installation and flowing through an exhaust line leading to the exterior of the heating installation and injection into said flue-gas of the nitrogen oxide reducing agent, said method comprising:

metering the value of at least one factor relating to the combustion process from among the factors of fuel flow rate, concentration of oxygen in the flue-gas, concentration of carbonic acid gas in the flow-gas, the flow rate of air employed in the combustion process and the amount of flue-gas, and using said metered value for calculating the NO_x concentration in the flue-gas;

directly measuring the value of the NO_x concentration in the flue-gas flowing in the exhaust line and relating said calculated NO_x value and said directly measured value for establishing a true NO_x value;

determining from said true NO_x value a basic calculation value indicating the requisite amount of nitrogen oxide reducing agent to be injected into said flue-gas; and

controlling the supply rate of said reducing agent injected into the flue-gas according to said basic calculation value.

4,188,191

PROCESS FOR REDUCING THE SULFUR CONTENT OF COAL AND COAL CHAR AND THE IGNITION TEMPERATURE OF COAL CHAR

James R. Longanbach, Claremont, and Leon Robinson, Upland, both of Calif., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.

Continuation of Ser. No. 429,708, Jan. 2, 1974, abandoned. This application Nov. 7, 1975, Ser. No. 629,875
Int. Cl.[2] C10L 9/10; C10B 57/00
U.S. Cl. 44—1 F 1 Claim

1. A process for producing low sulfur char from coal comprising converting said coal to char at a temperature of about 1000° F. to about 1100° F.; and adding said char to a bath of molten caustic, said bath having a ratio of molten caustic to char of at least about three to one, for a residence time of about ten minutes, wherein said molten caustic is formed from a mixture of about equal parts of sodium hydroxide and potas-

sium hydroxide, said bath is maintained at a temperature of about 500° F. to about 750° F., said char is removed from said bath and washed sufficiently to cause said char to be substantially free of said caustic, and the sulfur content of said char is reduced to a value no greater than about 0.7 percent by weight on a dry basis.

4,188,192

FIRE IGNITING METHOD AND APPARATUS

Sol J. Levenson, and Michael K. Levenson, both of 2636 S. Belvoir Blvd., University Hts., Ohio 44118

Filed Apr. 8, 1976, Ser. No. 674,885

Int. Cl.[2] C10L *11/00*

U.S. Cl. 44—39 **6 Claims**

1. As fire igniting apparatus, a composite structure comprising

(a) a shaving stock member consisting of a body formed of a shavable magnesium base alloy, shavings of which burn with a dazzling white flame when ignited from a spark from a pyrophoric material, said alloy containing more than 50 wt.% magnesium, the balance of said alloy being formed substantially of one or more elements selected from the group consisting of Al, Mn, Zn, Th, Zr and the rare earths, and

(b) a pyrophoric element secured to said shaving stock member and defining an exposed or exposable surface thereof.

4,188,193

PROCESS FOR PRODUCING HYDROCARBON GAS FROM ORGANIC PLANT MATERIAL

George T. Felbeck, Jr., Wakefield, R.I., assignor to University of Rhode Island, Kingston, R.I.

Filed Mar. 21, 1979, Ser. No. 22,528

Int. Cl.[2] C10J *3/00*; C10B *2/04*

U.S. Cl. 48—197 R **7 Claims**

1. The process for converting an organic material selected from the group consisting of a plant-derived organic material, an alcohol, a sugar, and mixtures thereof to a high BTU gas which comprises heating said organic material with ammonia, in the presence of a vanadium catalyst wherein the vanadium is in the +3 or +4 state and a hydrogenation catalyst in an atmosphere substantially free of oxygen and recovering a gaseous product.

4,188,194

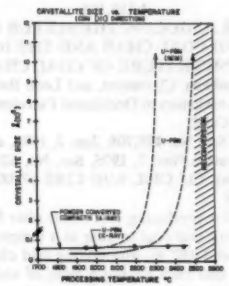
DIRECT CONVERSION PROCESS FOR MAKING CUBIC BORON NITRIDE FROM PYROLYTIC BORON NITRIDE

Francis R. Corrigan, Westerville, Ohio, assignor to General Electric Company, Worthington, Ohio

Continuation-in-part of Ser. No. 736,988, Oct. 29, 1976, abandoned. This application Jul. 1, 1977, Ser. No. 812,283

Int. Cl.[2] B24D *3/04*

U.S. Cl. 51—307 **7 Claims**



1. A high temperature and pressure process for making a sintered polycrystalline cubic boron nitride compact, said process comprising the steps of:

(a) placing preferentially oriented pyrolytic hexagonal boron nitride in a reaction cell, said boron nitride being substantially free of catalytically active materials, said cell having means for shielding said pyrolytic boron nitride from contamination during transformation;

(b) compressing said cell and the contents thereof at a pressure between about 50 kbars and 100 kbars;

(c) heating said cell and the contents thereof to a temperature of at least about 1800° C. within the cubic boron nitride stable region of the boron nitride phase diagram;

(d) maintaining said pressure and temperature conditions of steps (b) and (c) for a period of time sufficient to transform said pyrolytic boron nitride into a sintered polycrystalline cubic boron nitride compact;

(e) ceasing the heating of said cell; and

(f) removing the pressure applied to said cell.

4,188,195

TREATMENT OF WASTE LIQUOR

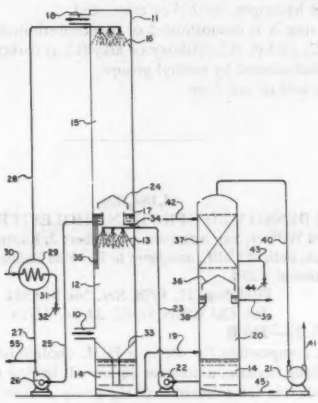
Richard Jablin, P.O. Box 514, Winchester, Va. 22601

Continuation-in-part of Ser. No. 833,917, Sep. 16, 1977, which is a division of Ser. No. 640,331, Dec. 12, 1975, Pat. No. 4,061,531. This application Jan. 4, 1978, Ser. No. 866,820

The portion of the term of this patent subsequent to Aug. 24, 1997, has been disclaimed.

Int. Cl.[2] B01D *47/00*

U.S. Cl. 55—89 **12 Claims**



1. A process of separating a hot industrial process gas selected from the group consisting of coal and oil gas into its components without addition of external heat comprising:

(a) feeding said gas directly from collecting mains of said industrial process to the first stage of a primary cooler;

(b) directly contacting said gas in said first stage with an aqueous brine, derived from step (m) hereinbelow, to cool said gas, to transfer components from said gas to the brine, and to heat said brine;

(c) passing said cooled gas from said first stage to a second stage of said primary cooler;

(d) directly contacting said gas in said second stage with a condensed liquor derived from step (l) hereinbelow to further cool said gas, to transfer components from said gas to said condensed liquor, and to heat said condensed liquor;

(e) withdrawing said further cooled gas from said second stage as the overhead from said primary cooler;

(f) passing said heated brine from said first stage directly to an evaporator without addition of further heat to said heated brine;

(g) applying a vacuum to said brine in said evaporator to boil said brine and form a cooled concentrated brine and a vapor without addition of heat;
(h) condensing a portion of said vapor in an indirect condenser to form a condensate and separately withdrawing said condensate and said uncondensed vapors;
(i) withdrawing a portion of said cooled concentrated brine from said evaporator as concentrated product;
(j) passing at least a portion of said heated condensed liquor from said second stage to an indirect heat exchanger;
(k) removing heat from said heated condensed liquor in said heat exchanger to cool said liquor passed thereto;
(l) feeding said cooled liquor from step (k) to said second stage for use in step (d); and
(m) feeding a portion of said cooled concentrated brine from step (g) to said first stage for use in step (b).

4,188,196

ABSORBER WITH SUCTION PUMP

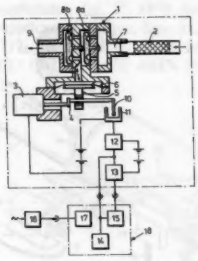
Rudolf Casper; Roland Gröber, both of Leverkusen; Karl-Heinz Schabel, Burscheid, and Klaus Siemer, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 19, 1977, Ser. No. 862,088

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1976, 2658739

Int. Cl.[2] B01D *53/04*

U.S. Cl. 55—270 **3 Claims**



1. A device for monitoring polutants, comprising an absorber, a suction pump connected downstream thereof, wherein the suction pump has inlet and outlet valves comprising O-ring disc valves and a pump drive and means for determining the quantity of air drawn through the pump in a given time period comprising a movable flag operatively connected to the pump drive and a light barrier through which the flag periodically moves during the pumping, wherein the determining means comprises counting means for counting the number of light pulses produced by the flag and light barrier and wherein the device further comprises a housing for the pump, flag, light barrier and counting means, said housing being sufficiently small to enable same to be worn on the body of a person for a complete working day without being cumbersome.

4,188,197

PARTICULATE FILTERING

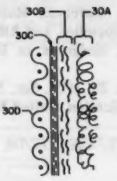
Suresh D. Amberkar, Framingham, Mass.; Elwood F. Hansen, and David E. Hansen, both of Allendale, N.J., assignors to Dennison Manufacturing Company, Framingham, Mass.

Continuation of Ser. No. 616,524, Sep. 25, 1975, abandoned. This application Oct. 3, 1977, Ser. No. 839,048

Int. Cl.[2] B01D *46/02*

U.S. Cl. 55—382 **10 Claims**

1. A filter medium comprising three elements, the first of which comprises a plurality of successive layers of different densities, the second of which is formed by fibers having different deniers; and the third of which is made up of glass fibers; said first element having a porosity greater than that of said



third element, and said second element having a porosity range between a value above the lowest porosity of said third element and below the highest porosity of said first element.

4,188,198

JOINT DOPING OF POROUS GLASSES TO PRODUCE MATERIALS WITH HIGH MODIFIER CONCENTRATIONS

Pedro B. Macedo, 6100 Highboro Dr., Bethesda, Md. 20034; Joseph H. Simmons, Bethesda, Md., and Mrinmay Samanta, Washington, D.C., assignors to Pedro Buarque de Macedo, Bethesdam and Theodore Aaron Litovits, Silver Spring, both of, Md.

Continuation-in-part of Ser. No. 755,590, Dec. 30, 1977. This application Nov. 23, 1977, Ser. No. 853,411

Int. Cl.[2] C03C *25/02, 15/00*

U.S. Cl. 65—3 A **5 Claims**

1. In a method of producing a glass article comprising adding a dopant to a porous glass matrix with interconnected pores by immersing the porous glass matrix in a solution of the dopant to impregnate the porous glass matrix with the solution, precipitating the dopant from the solution within the porous glass matrix, removing solvent and when necessary decomposition products from the porous glass matrix and collapsing the porous glass matrix to a solid form, the improvement which comprises immersing the porous glass matrix in a first dopant impregnating solution containing a mixture of dopants to impregnate the porous glass matrix with the first solution and form an impregnated porous glass matrix with the following composition:

(1) 7 to 25 weight % of the oxide equivalent of at least one member selected from the dopant group consisting of Pb and Bi, and
(2) 1.5 to 9 mole % of the oxide equivalent of at least one member selected from the dopant group consisting of Cs, Rb, and K,

and, prior to removing solvent and when necessary decomposition products from the porous glass matrix, immersing the impregnated porous glass matrix in a second dopant removing solution containing a separate solvent for each dopant group selected so that the solubilities of the dopants in the second solution are less than in the first solution and are approximately equal to within ±50% to decrease the concentration of each dopant substantially the same amount in the region of the article near the surface.

4,188,199

METAL COMPOUND COATING ON A FACE OF A CONTINUOUSLY LONGITUDINALLY MOVING GLASS RIBBON AND APPARATUS FOR USE IN FORMING SUCH COATING

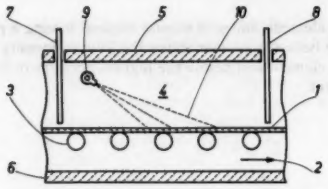
Robert Van Laethem, Loverval; Robert Leclercq, Auvelais; Philéas Capouillet, Gosselies, and Albert Van Cauter, Charleroi, all of Belgium, assignors to BFG Glassgroup, Paris, France

Filed Mar. 28, 1977, Ser. No. 781,957

Claims priority, application United Kingdom, Apr. 13, 1976, 15063/76

Int. Cl.[2] C03C *17/06, 17/22*

U.S. Cl. 65—60 C 30 Claims



1. A process for forming a uniform metal or metal compound coating on a face of a glass ribbon which comprises the steps of continuously longitudinally moving the glass ribbon in generally horizontal direction along a ribbon path, contacting the glass ribbon face while it is at elevated temperature, at a zone along the ribbon path, with a fluid medium containing a substance which undergoes chemical reaction or decomposition to form the metal or metal compound on said face, discharging continuously at least part of said fluid medium against said face in stream formation from stationary discharging means extending transversely across the ribbon path or from discharging means which are displaced to and fro transversely of the ribbon path, said stream formation having (1) a velocity component in the generally horizontal direction of movement of the glass ribbon and (2) an inclination to said face so that the acute or mean acute angle of incidence of the stream formation on said face, measured in a plane normal to said face and parallel with the direction of the glass ribbon movement, is not more than 60°.

9. A process as defined in claim 1, wherein said face is the top face of a continuous ribbon of float glass which is in the course of being formed.

4,188,200

METHOD AND APPARATUS FOR PRODUCTION OF PLATE GLASS

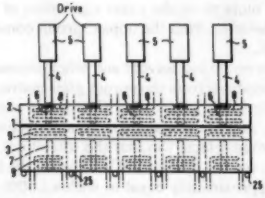
Hannes S. Horn, Im Defdahl 51, 4600 Dortmund 1, Fed. Rep. of Germany

Filed Oct. 25, 1978, Ser. No. 954,588

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1977, 2747832; Oct. 26, 1977, 2747834

Int. Cl.[2] C03B *5/26*

U.S. Cl. 65—90 20 Claims



1. A method for production of wide bands of plate glass in which glass flows out of a nozzle orifice of a flat nozzle formed by two nozzle bars, comprising the steps of:

deforming in a controlled manner at least one of the nozzle bars so as to change its form in order to compensate for a distortion of at least one of the nozzle bars.

13. A nozzle system for the production of a band of plate glass, comprising:

two nozzle bar means in spaced apart relationship for forming a substantially flat band of plate glass;

one of the nozzle bar means being elastically deformable; and

adjusting means connected to control elastic deformation of said one nozzle bar means in accordance with a desired deformation.

4,188,201

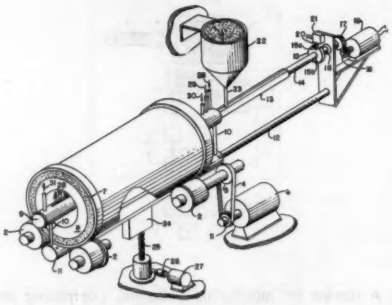
APPARATUS FOR FORMING AN INGOT IN A ROTATING HOUSING

Lothar Jung, 32 Lurline Dr., Millington, N.J. 07946

Filed Apr. 17, 1978, Ser. No. 897,117

Int. Cl.[2] C03B *19/04, 3/00, 23/20*

U.S. Cl. 65—302 22 Claims



1. An apparatus for manufacturing an ingot from a particulate ingot-forming material comprising:

(a) a housing mounted for rotation in a generally horizontal plane about a central axis, said housing defining an interior surface for receiving the particulate material and supporting the ingot formed from same;

(b) means for rotating the housing about its central axis at a speed sufficient to hold the particulate material against the interior surface by centrifugal force;

(c) means for depositing the particulate material by gravity onto the interior surface of said housing, said depositing means including an elongated hollow feeder tube having a slot or opening along its length for receiving and releasing the particulate material;

(d) means for introducing particulate material into the tube through the slot;

(e) means for selectively moving the tube into the housing interior with the slot in the uppermost position;

(f) means for rotating the tube until the slot reaches the lowermost position for discharge of the particulate material along the length of the housing interior; and

(g) heating means coextensive with the fully inserted feeder tube, said heating means arranged to melt the particulate material clinging to the interior surface of said housing as that clinging material is rotated to the uppermost position.

4,188,202

COMPOSITION

Christopher Gillings; Ian C. Jewry, both of Cambridge, and Harold G. Haynes, Royston, all of England, assignors to Fisons Limited, London, England

Continuation of Ser. No. 737,987, Nov. 2, 1976, abandoned. This application May 19, 1978, Ser. No. 907,848

Claims priority, application United Kingdom, Nov. 12, 1975, 46659/75

Int. Cl.[2] A01N *9/00*

U.S. Cl. 71—88 8 Claims

1. An aqueous suspension concentrate which comprises from 100 to 700 g/l of 2-ethoxy-2,3,dihydro-3,3-dimethylbenzofuran-5-yl methane sulphonate at least 85% by weight of the particles thereof having a diameter of less than 5 microns as measured by Coulter Counter, from 0.5 to 10 g/l of a xanthomonas hydrophilic colloid, from 0.5 to 30% by weight, based upon the weight of said sulphonate present, of a surface active agent which comprises a block copolymer of ethylene oxide and propylene oxide and which has a reversible thickening temperature of 45° C. or above, and from 0.5 to 30% by weight, based upon the weight of said sulphonate present, of an anionic deflocculating agent.

4,188,203

HERBICIDAL AND PHYTOHORMONAL AMIDOXIMES

Daniel Farge, Thiais; Jean Leboul, Gif; Yves Le Goff, Bretigny, Orge, and Gilbert Poiget, Thiais, all of France, assignors to Philagro, France

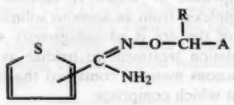
Continuation-in-part of Ser. No. 772,215, Sep. 10, 1976, Pat. No. 4,116,974. This application Jul. 27, 1978, Ser. No. 928,371

Claims priority, application France, Sep. 11, 1975, 75 27884; Jul. 8, 1976, 76 21717; Jul. 28, 1977, 77 24114

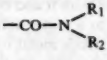
Int. Cl.[2] C07D *333/26*; A01N *9/12*

U.S. Cl. 71—90 8 Claims

1. A compound of the formula:



in which: R represents a hydrogen atom or an alkyl radical containing from 1 to 4 carbon atoms and A represents a cyano group or a radical of the general formula:



in which R_1 and R_2, which are identical or different, each represent a hydrogen atom, an alkyl radical containing from 1 to 4 carbon atoms, an optionally substituted phenyl radical or an amino radical which is itself optionally substituted.

4,188,204

METALLURGICAL PROCESS USING LIQUID FUELS

James L. Norman, and Donald J. Mayhall, both of Houston, Tex., assignors to Falconbridge Nickel Mines Limited, Toronto, Canada

Filed Feb. 6, 1979, Ser. No. 9,880

Int. Cl.[2] C22D *7/06*

U.S. Cl. 75—11 5 Claims

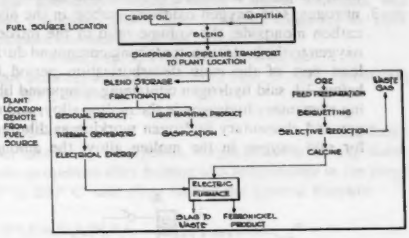
1. In a process for the recovery of ferronickel from lateritic nickel ores utilizing liquid hydrocarbons, at a location remote from a source of liquid hydrocarbons, the improvement comprising:

(i) blending heavy crude oil with naphtha to form a blend pumpable at ambient temperature;

(ii) transporting the blend between the source and the remote location by means which include pumping, at ambient temperature, through a pipeline;

(iii) fractionating the blend at the remote location to recover a light, low-sulphur naphtha product, and a heavy high-sulphur residual product;

(iv) partially combusting the naphtha product with air to form a hot reducing gas, and contacting the ore with the gas to obtain a hot, selectively reduced, calcine;



(v) using the heavy high-sulphur residual product for thermal generation of electrical energy;

(vi) using the electrical energy to melt the calcine to form a substantially barren slag underlain by a molten layer of ferronickel; and

(vii) separating the ferronickel from the slag.

4,188,205

FUEL INJECTION IN BLAST FURNACES

Donald E. Fless, Burlington, Canada, assignor to Alchem, Inc., Burlington, Canada

Filed Mar. 6, 1978, Ser. No. 883,772

Int. Cl.[2] C22B *5/00*

U.S. Cl. 75—42 12 Claims

1. An improved process for injecting a homogenized water-hydrocarbon liquid fuel composition into blast furnaces of the type wherein water and a liquid hydrocarbon fuel are homogenized and then atomized into a blast furnace under pressure to reduce coke consumption, the improvement which comprises introducing into the water-hydrocarbon liquid fuel composition prior to homogenization a metallic element in the form of a compound thereof, said metallic element being selected from the group consisting of zirconium, chromium, molybdenum, tungsten, manganese, iron, cobalt, nickel, copper, zinc, aluminum, tin and lead in a quantity sufficient to provide 5–50 ppm as metal in the water-hydrocarbon liquid fuel composition whereby the efficiency of the blast furnace water-hydrocarbon liquid fuel injection is improved.

4,188,206

METALLURGICAL PROCESS

Mans K. O. Johnsson, and Lars A. Eriksson, both of Hagfors, Sweden, assignors to Uddeholms Aktiebolag, Uddeholms, Sweden

Division of Ser. No. 550,554, Feb. 18, 1975, Pat. No. 4,021,233, which is a division of Ser. No. 295,355, Oct. 5, 1972, Pat. No. 3,867,135. This application May 2, 1977, Ser. No. 792,790

Claims priority, application United Kingdom, Oct. 8, 1971, 46507/71; Feb. 28, 1972, 9162/72; Sweden, Jun. 9, 1972, 7583/72

Int. Cl.[2] C21C *5/34*

U.S. Cl. 75—60 13 Claims

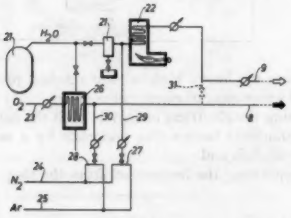
1. A method of reducing the carbon content of a carbon-containing alloy, said alloy containing at least 10by weight of chromium and, as the major component thereof, at least one metal selected from the group consisting of iron, cobalt and nickel, said method comprising:

(a) first melting the alloy and bringing the molten alloy substantially up to the decarburization temperature essen-

tially by oxidising substantially completely any silicon present in the alloy and optionally, any other oxidizable component present in the alloy,

(b) thereafter, decarburizing the alloy at a decarburization temperature of about 1550° to about 1800° C. by introducing into the molten alloy at a depth of at least about 20 cm below the surface thereof:

1. oxygen; and
2. at least one hydrogen containing compound selected from the group consisting of steam and ammonia; and
3. nitrogen; said oxygen oxidising carbon in the alloy to carbon monoxide, the volume ratio of the introduced oxygen to the hydrogen containing compound during at least part of the main decarburization period being below 3:1, said hydrogen containing compound liberating elementary hydrogen in the molten alloy, said nitrogen and elementary hydrogen working as diluting gas for said oxygen in the molten alloy, the amount of



diluting gas and carbon monoxide in the molten alloy being such that the partial pressure of carbon monoxide in the molten alloy is below 0.5 atmospheres and lower than that partial pressure which corresponds to the equilibrium pressure for the carbon/chromium oxidation,

(c) maintaining the molten alloy at a decarburization temperature of at least about 1500° C. essentially by oxidizing chromium in the alloy, wherein the decarburization temperature is at least partly controlled by varying the volume ratio of introduced oxygen to hydrogen-containing compound, said ratio being decreased during the course of the decarburization to below 1:1, using amounts and concentrations such that the decarburization temperature is essentially maintained at no greater than about 1800° C., and,

(d) thereafter removing at least part of the hydrogen remaining in the molten alloy.

4,188,207

ALUMINUM PRODUCTION

Clyde M. Adams, Jr., 3509 Biddle St., Cincinnati, Ohio 45220

Filed Oct. 23, 1978, Ser. No. 953,561
Int. Cl.[2] C22B *21/00*
U.S. Cl. 75—68 B **10 Claims**

1. A process for separating and refining aluminum comprising:

bringing together in a closed process environment a mixture of:

(a) an aluminum-bearing raw material,

(b) at least one alkaline earth chloride selected from the group consisting of calcium, barium, strontium and magnesium chlorides, and

(c) at least one reducing agent selected from the group consisting of silicon, ferrosilicon, calcium silicide, calcium carbide, silicon carbide, aluminum and carbon;

heating said mixture above 1600° C.,

during said heating, venting a mixture of gases emitted from the hot mixture into a cooling zone; and

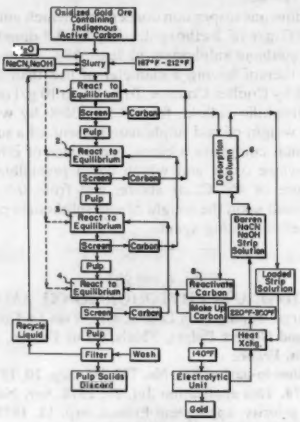
collecting condensed chlorides and aluminum from said vented gases.

4,188,208

RECOVERY OF GOLD FROM CARBONACEOUS GOLD-BEARING ORES

Wilbur J. Guay, Newtown, Conn., assignor to Newmont Exploration Limited, Danbury, Conn.

Continuation-in-part of Ser. No. 908,166, May 22, 1978, abandoned. This application Dec. 22, 1978, Ser. No. 972,278
Int. Cl.[2] C22B *11/08*
U.S. Cl. 75—105 **8 Claims**



1. In the process for the recovery of gold from sedimentary gold-bearing ores containing indigenous organic carbonaceous material a component of which is capable of adsorbing aurocyanide complexes from an aqueous solution, wherein an aqueous slurry of the ore is advantageously subjected to a preliminary oxidation treatment to oxidize as much of the organic carbonaceous material contained therein as possible, the improvement which comprises:

subjecting the oxidized ore to a combined cyanidation and adsorption treatment by (a) forming an aqueous pulp by the oxidized ore, (b) heating the aqueous pulp to a temperature of between about 167° and 212° F., (c) adding an alkali metal cyanide and alkali metal hydroxide to the aqueous pulp to react with it and convert the gold content of the oxidized ore to a water soluble aurocyanide complex, the amount of alkali metal cyanide and alkali metal hydroxide added to the aqueous pulp being such that the pulp contains from about 0.1 to 1.0% by weight of alkali metal cyanide and from about 0.1 to 10% by weight of alkali metal hydroxide, (d) adding particles of granular activated carbon to the aqueous pulp to adsorb a major portion of the aurocyanide complex on the surface of said particles, and (e) agitating the aqueous pulp to promote the cyanidation reaction and the concurrent adsorption of the aurocyanide complex produced thereby for a period of time sufficient to allow these processes to approach chemical and physical equilibrium;

separating the particles of granular activated carbon on the surface of which said aurocyanide complex has been adsorbed from the aqueous pulp containing the oxidized ore from which said gold compounds have been extracted;

subjecting said particles of activated carbon to an aurocyanide complex desorption treatment to strip the aurocyanide complex from the surface of the activated carbon; and

recovering said aurocyanide complex and converting the gold content thereof to metallic gold.

4,188,209

NICKEL-BASE ALLOY

Gerhard Kruske, Oberursel, Fed. Rep. of Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 29, 1977, Ser. No. 828,718
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1976, 2639325
Int. Cl.[2] C22C *19/05*
U.S. Cl. 75—122 8 Claims

1. A nickel-base alloy which is resistant to corrosion, abrasion, erosion, cavitation and to temperature cycles and possesses a high high-temperature strenght, consisting essentially of the following composition in % by weight:

Carbon: 0.5 to 5
Tungsten: 7 to 15
Chromium: 25 to 55
Boron: 0.5 to 3.5
Silicon: 1 to 5
Iron: 1 to 5
Nickel: balance

and

(a) % by weight C=% by weight C_1+% by weight C_2+0.2;

(b) % by weight W=36×% by weight C_1; and

(c) % by weight Cr≧17+9×% by weight C_2−4×% by weight C, % by weight C_1 being the carbon content required to form carbide refractory materials and % by weight C_2 being carbon content required to form chromium carbide.

4,188,210

IRON AND/OR STEEL TREATMENT WITH MAGNESIUM AND REFRACTORY COATED COMPOSITE SHOT

James F. Bregi, Plymouth, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Feb. 6, 1978, Ser. No. 875,273
Int. Cl.[2] C22C *33/08*
U.S. Cl. 75—130 R 6 Claims

1. A process for the production of cast iron castings comprising:

(a) introducing into a ladle a predetermined charge of molten iron having sulfur in the range of 0.04–0.12% by weight of such composition that it would be a grey cast iron with the graphite in flake form if case, the charge is of such quantity to provide a ferrostatic head of at least two feet;

(b) either prior to or simultaneous with step (a), pouring a charge of coated iron-based shot onto the bottom of said ladle, each particle of said shot having a diameter substantially in the range of 0.4–0.20 inches, each particle of shot having an inner coating of substantially pure magnesium and an outer coating of a refractory material resistant to melting at molten iron temperatures, said magnesium coating forming a thin shell about each of said particles with a uniform thickness of 0.018–0.22 inches, said outer coating consisting of a wash in the thickness range of 0.004–0.010 inches, said iron based shot being added in a quantity predetermined to carry sufficient magnesium for at least desulfurizing said molten iron and acting as a chill core to promote liquidification of said magnesium coating by the heat of said molten iron.

4,188,211

THERMALLY STABLE AMORPHOUS MAGNETIC ALLOY

Norishige Yamaguchi; Kazuo Ohya; Osamu Kohmoto, and Hiroki Fujishima, all of Tokyo, Japan, assignors to TDK Electronics Company, Limited, Tokyo, Japan

Filed Feb. 9, 1978, Ser. No. 876,528
Claims priority, application Japan, Feb. 18, 1977, 52-16816; Feb. 24, 1977, 52-19460
Int. Cl.[2] C22C *19/00, 19/05*
U.S. Cl. 75—170 42 Claims

1. An essentially amorphous, magnetic alloy having stable magnetic properties after heating to a temperature in the range of 100° to 200° C. said alloy having the general formula:

$$(Fe_aCo_bNi_c)_x(Si_eB_f)_y,$$

wherein, a, b and c are the molar fractions of iron, cobalt and nickel, respectively, wherein a+b+c=1.00; e and f are the molar fractions of silicon and boron, respectively, wherein e+f=1.00; x is the atomic percent of iron, cobalt and nickel; and y is an atomic percent of silicon and boron, based on the alloy, respectively, and, wherein a, c, e, f and y are defined by the following relationships:

$$0.03 \leqq a \leqq 0.12$$

$$0 \leqq c \leqq 0.60$$

$$27.5 - 8c \leqq y \leqq 35 - 19c$$

$$0 \leqq ey \leqq 25, \text{ and}$$

$$0 \leqq fy \leqq 30.$$

5. An essentially amorphous magnetic alloy having stable magnetic properties after heating to a temperature in the range of 100° to 200° C. and which has a reduced irreversible dependence of the initial permeability over a temperature range of −40° C. to 120° C., said alloy having the general formula:

$$(Fe_aCo_bNi_c)_x\,(Si_eB_f)_y,$$

wherein, a, b and c are the molar fractions of iron, cobalt and nickel, respectively, wherein a+b+c=1.00; e and f are the molar fractions of silicon and boron, respectively, wherein e+f=1.00; x is the atomic % of iron cobalt and nickel and y is the atomic % of silicon and boron, respectively, based on the composition expressed by said general formula, and, further, said values a, b, e, f and y are defined by the following relationships:

$$0.03 \leqq a \leqq 0.12;$$

$$0.40 \leqq b \leqq 0.85;$$

$$20 \leqq y \leqq 35;$$

$$0 \leqq ye \leqq 25, \text{ and;}$$

$$0 < fy \leqq 30;$$

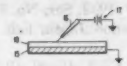
and, wherein at least one element selected from the group consisting of Ti, Zr, V, Nb, Ta, Cr, Mo, W, Zn, Al, Ga, In, Ge, Sn, Pb, As, Sb and Bi in an amount from 0.5 to 6.0 atomic % based on the total components of the amorphous alloy is present in said alloy expressed by said general formula.

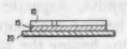
4,188,212

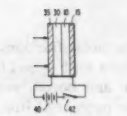
ELECTRIC CURRENT CONDUCTIVE COMPOSITION, IMAGE RECORDING ELEMENT CONTAINING THE SAME AND PROCESS FOR RECORDING IMAGES USING THE SAME

Masato Fujiwara; Mitsuharu Nirasawa, and Keiji Takeda, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 16, 1977, Ser. No. 825,114
Claims priority, application Japan, Aug. 18, 1976, 51-98533
Int. Cl.[2] G03G *5/04, 13/22*
U.S. Cl. 430—69 **55 Claims**







10. An image recording element comprising (i) a first electrically conductive layer, (ii) a layer of an electric current conductive composition consisting essentially of benzotriazole, nitrobenzotriazole, an alkylbenzotriazole in which the alkyl moiety thereof has up to about 20 carbon atoms, a halobenzotriazole and an amidobenzotriazole in which the amido moiety thereof has up to about 20 carbon atoms, (b) a substantially electrically insulating binder, (c) a reducible metal compound and (d) a reducing agent for said reducible metal compound, (iii) a photoconductive material layer and (iv) a second electrically conductive layer, in this order, with at least one of said electrically conductive layers ((i) and/or (iv)) being transparent to actinic irradiation, wherein said component (a) is present in an amount efffective to render said layer containing said substantially electrically insulating binder electric current conductive by reducing the specific resistance of said binder, whereby a latent image can be formed in said layer of electric current conductive composition upon production of an imagewise distribution of an electric current therein.

4,188,213

COLOR CORRECTED PRINTING SYSTEM

Richard F. Lehman, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 421,387, Dec. 3, 1973, Pat. No. 3,902,801.
This application Mar. 28, 1975, Ser. No. 563,021
Int. Cl.[2] G03G *13/01*
U.S. Cl. 430—43 **3 Claims**

1. A method of producing a color copy, including the steps of:

recording successive single color electrostatic latent images on an image bearing member;

developing each successive single color electrostatic latent image with particles containing a predetermined dominant colorant therein corresponding to each recorded single color electrostatic latent image, said step of developing comprising the steps of depositing particles containing a dominant cyan colorant with a minor magenta colorant impurity on an electrostatic latent image formed from a red filtered light image, depositing particles containing a dominant magenta colorant with a minor yellow impurity on an electrostatic latent image formed from a green filtered light image, and depositing particles containing a dominant yellow colorant on an electrostatic latent image formed from a blue filtered light image;

transferring successive layers of particles to a sheet of support material such that the layer of particles having the dominant magenta colorant with the minor yellow colorant is superimposed over the layer of particles having the dominant cyan colorant with the minor magenta colorant impurity and the layer of particles having the dominant yellow colorant is superimposed over both of the previously transferred layers of particles; and

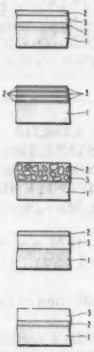
regulating electrically said transfer step so that successively thinner layers of particles are transferred from the image bearing member, to the sheet of support material resulting in a substantially color corrected copy.

4,188,214

RECORDING MATERIAL

Keishiro Kido; Satoshi Yoshida, and Tomoaki Ikeda, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 695,212, Jun. 11, 1976, abandoned.
This application Feb. 3, 1978, Ser. No. 875,066
Claims priority, application Japan, Aug. 11, 1975, 50-97251
Int. Cl.[2] G03C *5/04, 1/76*
U.S. Cl. 430—494 **4 Claims**



1. A material for recording a laser beam scanned imagewise by evaporating or deforming scanned portions of a recording layer thereof by the heat energy of the laser beam, which comprises a support and at least one recording layer vapour deposited thereon having a thickness of about 300 Å to about 1500 Å and said layer comprising at least one metal selected from the group consisting of Sn, Bi, In, Zn, Al and Cu, wherein the improvement comprises said layer also containing one or more compounds selected from the group consisting of CrS, Cr_2S, Cr_2S_3, MoS_2, MnS, FeS, FeS_2, CoS, Co_2S_3, NiS, Ni_2S, PdS, Cu_2S. Ag_2S, ZnS, In_2S_3, In_2S_2, GeS_x, wherein x is a positive integer of 2 to 9, SnS, SnS_2, PbS, As_2S_3, Sb_2S_3, Bi_2S_3, MgF_2, CaF_2, RhF_3, MoO, InO, In_2O, In_2O_3, GeO and PbO, and wherein the volume ratio of said one or more compounds to said one or more metals is about 1/5 to about 1/30 in said at least one layer.

4,188,215

PHOTOSENSITIVE PRINTING PLATE, METHOD OF PREPARING SAME, AND METHOD OF PROCESSING SAME

Masamichi Sato; Sadaharu Ikeda, and Tomoaki Ikeda, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation-in-part of Ser. No. 742,494, Nov. 17, 1976, abandoned. This application Apr. 24, 1978, Ser. No. 899,680
Claims priority, application Japan, Nov. 17, 1975, 50-138424
Int. Cl.[2] G03C *1/76, 3/00;* G03F *7/02*
U.S. Cl. 430—156 12 Claims

1. A photosensitve printing plate comprising a support with a hydrophilic surface having formed in succession thereon (1) a layer of an oleophilic photosensitive resin composition which is sensitive to ultraviolet rays and wherein when the composition is exposed to ultraviolet rays a change occurs at exposed areas, whereby the exposed portions of the layer either become insoluble or soluble in a solvent, and (2) directly on said layer (1), a layer of photosensitive silver halide which is developable using an aqueous developer solution for the silver halide and comprising a dispersion of particles of photosensitive silver halide grains coated with a water soluble polymer in an oleophilic binder resin capable of being dissolved in a developer for said photosensitive resin composition, wherein the ratio of the silver halide to the water-soluble polymer, by weight, is 8:1 to 1:6 and the oleophilic binder is used in an amount of from 0.001 to 0.5 parts by weight per part by weight of the silver halide grains.

4,188,216

METHOD OF PRINT DYEING TEXTILE MATERIALS

Jon M. Blumenaus, Dalton, Ga., assignor to World Carpets, Inc., Dalton, Ga.

Division of Ser. No. 829,250, Aug. 30, 1977, Pat. No. 4,159,892. This application Apr. 21, 1978, Ser. No. 898,880
Int. Cl.[2] G03C *5/04, 13/14;* G03F *1/00;* G03C *5/00*
U.S. Cl. 430—22 7 Claims

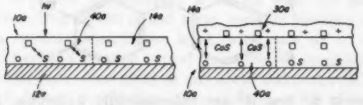
1. A method for preparation of the final film used for engraving a screen for use in continuous print dyeing of textile fabrics with a continuous pattern wherein the image to be reproduced is taken from a photograph and provides a continuous pattern having a three dimensional appearance on the face of the printed fabric which comprises setting off a select area of the photograph to form a pattern with a predetermined outline to establish the basic repeat for the pattern without obvious discontinuities, preparing a plurality of continuous tone color separations of the selected pattern to provide red, green, blue and black continuous tone negatives which represent the colors of the original image, preparing a posterized and a half-tone positive of each color separation, selectively combining the posterized and half-tone positives to provide a negative for use in engraving one or more screens with the combined negative.

4,188,217

CATALYTIC ACTIVATION OF COBALT COMPLEX IMAGING BY COBALT SULFIDE

Glenn R. Wilkes, Webster, and Albert T. Brault, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 595,932, Jul. 14, 1975, Pat. No. 4,061,497. This application Sep. 15, 1977, Ser. No. 833,787
Int. Cl.[2] G03C *5/24*
U.S. Cl. 430—353 4 Claims



1. A process for forming an image in an element having a support bearing a layer containing a cobalt sulfide precursor composition comprising a photoreducible inert cobalt(III) complex capable of forming cobalt sulfide in the presence of a source of sulfide ions, and a source of sulfide ions capable of combining with cobalt(II) to form cobalt sulfide;

the process comprising

(a) imagewise exposing said layer;

(b) heating said layer, whereby the complex and the sulfide ion source combine to form a cobalt sulfide image, and

(c) reacting a reducible cobalt(III) complex and a primary aromatic amine developing agent in the presence of the imagewise distributed cobalt sulfide and a color coupler, whereby the developing agent is oxidized and the oxidized developer reacts with the coupler to form a dye image.

4,188,218

IMAGES FORMED BY DECOMPOSITION OF TE (II) COORDINATION COMPLEXES

Henry J. Gysling, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 703,405, Jul. 8, 1976, abandoned. This application Dec. 22, 1977, Ser. No. 863,199
Int. Cl.[2] G03C *1/00, 1/48*
U.S. Cl. 430—495 9 Claims

1. A photosensitive element comprising a support having thereon

(1) a layer comprising a binder and a compound capable of forming an image of nuclei of one or more metals selected from the group consisting of Te, Pd, Ag and Cu; and

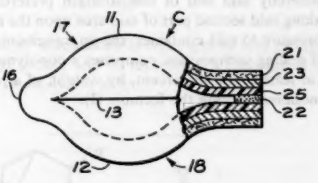
(2) a layer comprising a binder and a coordination complex of tellurium (II) and two univalent bidentate sulfur containing ligands, wherein said tellurium (II) is coordinated to said ligands through said sulfur, said layers being in reactive association.

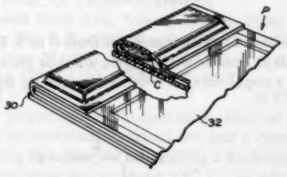
4,188,219

RUPTURABLE FLUID CONTAINER AND ELEMENTS CONTAINING SAME

John D. Cawley, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 13, 1978, Ser. No. 959,827
Int. Cl.[2] G03C *1/48, 5/54;* B43M *3/00;* B65D *35/14*
U.S. Cl. 430—208 22 Claims





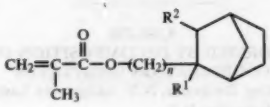
1. In a container useful for holding a fluid, said container comprising:

a pair of opposed walls marginally sealed together over a

substantial area to provide an internal cavity adapted to retain said fluid, at least one of said walls being flexible and deformable, said opposed walls being marginally sealed together over a first part of said area, and a polymeric sealing composition interposed between said opposed walls over a second part of said area forming a seal of less strength than over said first part of said area, whereby said seal of less strength preferentially bursts along said second part of said area upon the application of pressure to said container, the improvement wherein:

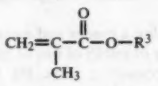
said sealing composition comprises a copolymer of

(a) at least about 50 percent, by weight, of a polymerizable monomer having the formula (I):



wherein n is an integer of from 0 to 3; R^1 is hydrogen or alkyl; and R^2 is hydrogen, alkyl or phenyl; with

(b) a copolymerizable monomer having the formula (II):



wherein R^3 is alkyl,

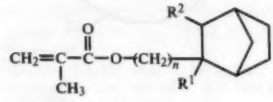
said copolymer having a glass transition temperature of at least about 80° C.

13. In a photographic film unit comprising a support and a container useful for holding fluid photographic processing material, said container comprising:

a pair of opposed walls marginally sealed together over a substantial area to provide an internal cavity adapted to retain said processing material, at least one of said walls being flexible and deformable, said opposed walls being marginally sealed together over a first part of said area, and a polymeric sealing composition interposed between said opposed walls over a second part of said area forming a seal of less strength than over said first part of said area, whereby said seal of less strength preferentially bursts along said second part of said area upon the application of pressure to said container, the improvement wherein:

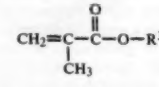
said sealing composition comprises a copolymer of

(a) at least about 50 percent, by weight, of a polymerizable monomer having the formula (I):



wherein n is an integer of from 0 to 3; R^1 is hydrogen or alkyl; and R^2 is hydrogen, alkyl or phenyl; with

(b) a copolymerizable monomer having the formula (II):



wherein R^3 is alkyl,

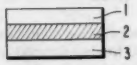
said copolymer having a glass transition temperature of at least about 80° C.

4,188,220

SUPPORTS FOR PHOTOGRAPHIC PAPER AND PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Tsuneo Kasugai, and Keishi Kitagawa, both of Fujimiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Mar. 31, 1976, Ser. No. 672,357
Claims priority, application Japan, Mar. 31, 1975, 50-39526
Int. Cl.[2] G03C *1/85*
U.S. Cl. 430—536 **7 Claims**



1. A base support coated with a resin composition which comprises about 5 to about 25 parts by weight of a low molecular weight polyolefin having a number average molecular weight of from about 1,500 to about 10,000 in combination with 100 parts by weight of a polyolefin resin having a number average molecular weight of 20,000 to 200,000.

4,188,221

PHOTOSENSITIVE POLYAMIDE RESIN COMPOSITION USEFUL FOR MAKING RELIEF PRINTING PLATE

Masaru Nanpei; Toshiaki Fujimura; Hajime Kouda; Yoshihiro Kasho, and Kuniomi Etoh, all of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

Filed May 8, 1978, Ser. No. 904,168
Claims priority, application Japan, May 14, 1977, 52-55744
Int. Cl.[2] G03C *1/68*
U.S. Cl. 430—288 **16 Claims**

1. A photosensitive polyamide resin composition useful for making a relief printing plate, which comprises 30 to 90% by weight of a water-soluble polyamide having ammonium type nitrogen atoms and 5 to 70% by weight of a photopolymerizable unsaturated compound prepared by reacting (meth)acrylic acid (I) and a polyglycidyl ether of an aliphatic polyvalent alcohol (II) in an equivalent ratio of $0.5 \leqq (I)/(II) \leqq 2.0$.

15. A photosensitive article useful in forming a relief printing plate comprising a layer of the composition of claim 1 on a support layer.

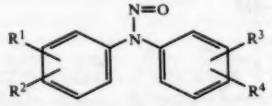
4,188,222

PHOTOCURABLE COMPOSITION CONTAINING AN N-NITROSODIARYLAMINE

Tuguo Nezu, and Nobuyoshi Miyata, both of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Japan

Filed Sep. 15, 1975, Ser. No. 613,625
Claims priority, application Japan, Sep. 17, 1974, 49-106013
Int. Cl.[2] G03C *1/68*
U.S. Cl. 430—284 **10 Claims**

1. A photocurable composition comprising a major part of a photopolymerizable compound having at least two ethylenically unsaturated bonds in one molecule thereof, a minor part of a photosensitizer and 0.001–1.0% of an N-nitrosodiarylamine expressed by the formula



(wherein R^1 and R^2 are independently hydrogen, an alkyl group having 1–3 carbon atoms, a phenyl group, a halogen atom, a methoxy group, an ethoxy group, a dimethylamino group or a diethylamino group, and R^3 and R^4 are indepen-

dently hydrogen, an alkyl group having 1–9 carbon atoms, a cyclohexyl group, a phenyl group, a halogen atom, a methoxy group, an ethoxy group, a dimethylamino group or a diethylamino group).

4,188,223

AMINO-FUNCTIONAL PHOTOPOLYMER COMPOSITIONS AND PHOTO-OXIDATION IMAGING PROCESSES EMPLOYING SAME

James C. Woodbrey, Chesterfield, Mo., and Marlowe V. Moncur, Pensacola, Fla., assignors to Monsano Company, St. Louis, Mo.

Filed Dec. 30, 1977, Ser. No. 866,133
Int. Cl.[2] G03C *1/68, 5/00*
U.S. Cl. 430—270 **13 Claims**

1. A photopolymer composition comprising an amino-functional photopolymer having two or more amino-functional groups per polymeric unit, said amino-functional groups comprising one selected from the group consisting of tertiary aliphatic amines, hindered secondary aliphatic amines, dialkyl aryl amines and combinations thereof, and

a photosensitizer capable of generating singlet molecular oxygen upon being subjected to electromagnetic radiation in the presence of ordinary molecular oxygen,

said photopolymer being capable of undergoing a photo-oxidation reaction when exposed to electromagnetic radiation in the presence of said photosensitizer and ordinary molecular oxygen.

4,188,224

PHOTOPOLYMERIZABLE COMPOSITION CONTAINING ANTHRONES

Louis Felder, Basel, and Rudolf Kirchmayr, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 768,243, Feb. 14, 1977, abandoned.
This application Apr. 3, 1978, Ser. No. 892,568
Claims priority, application Switzerland, Feb. 23, 1976, 2173/76
Int. Cl.[2] G03C *1/68*
U.S. Cl. 204—159.15 **6 Claims**

1. A photopolymerizable composition consisting essentially of one or more esters of acrylic acid or methacrylic acid and 0.5 to 5% by weight of a compound selected from the group consisting of 10,10-dimethoxyanthrone, 10,10-diethoxyanthrone and 10,10-ethylenedioxyanthrone.

4,188,225

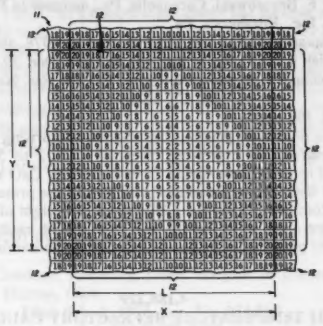
HALFTONE SCREEN WITH CELL MATRIX

Hua-Kuang Liu, Tuscaloosa, Ala., assignor to Lumin, Inc., Tuscaloosa, Ala.

Filed Apr. 10, 1978, Ser. No. 894,902
Int. Cl.[2] G03F *5/00*
U.S. Cl. 430—7 **12 Claims**

1. In a screen for use in the reproduction of continuous-tone graphic images:

screen means for use in the reproduction of continuous-tone graphic images, said screen means comprising a two dimensional matrix of cells, said cells having a common pattern of optical transmittance levels, said common pattern of optical transmittance levels for each cell being characterized by sets of unit areas, each set having a uniform optical transmittance level, with each set of unit areas having a discrete optical transmittance level differing from each other array of unit areas within the cell by a well-defined combination of unit step functions of transmittance, and said well-defined combination of unit step functions being functions of two variables, one variable being the distance to the point where the optical transmittance level is evaluated from the boundary of a first side of said cell, and the other variable being the distance of said



point from the boundary of the side adjacent said first side of said cell.

4,188,226

DRY IMAGE FORMING MATERIAL CONTAINING DIARYLHALOMETHANE

Kageyasu Akashi; Yoshio Hayashi; Tatsumi Arakawa; Takeo Kimura, and Hidehiko Kobayashi, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 6, 1978, Ser. No. 922,463
Claims priority, application Japan, Jul. 18, 1977, 52/85109
Int. Cl.[2] G03C *1/02*
U.S. Cl. 430—620 **7 Claims**

1. A dry image forming material comprising:

(a) a non-photosensitive organic silver oxidizing agent;

(b) a reducing agent for silver ion; and

(c) a compound of the formula,

wherein R^1 and R^2 independently represent an aryl group or a substituted aryl group; and X represents a chlorine atom, a bromine atom or an iodine atom.

4,188,227

METHOD OF PREPARING MULTI-COMPONENT CHEMICAL COMPOSITIONS

Randy L. Bauer, 4606 Sixth Ave., Vienna, W. Va. 26105, and Gerald A. Krulik, Rte. 1, Box 212, Washington, W. Va. 26181

Filed May 27, 1977, Ser. No. 801,185
Int. Cl.[2] C09D *5/20;* C09K *3/00, 3/18*
U.S. Cl. 106—1.27 **10 Claims**

1. A process for preparing a multicomponent chemical composition including an unreacted hydrated salt and a complexing agent comprising the steps of: (1) melting a hydrated salt which has a melting point below about 100° C.; (2) adding a complexing agent to the molten salt, said complexing agent being incapable of a direct combination reaction with said hydrated salt; (3) mixing said complexing agent into said molten salt to form a homogeneous mass; and (4) cooling said mass to solidify the resulting product.

4,188,228

FIBER GLASS MAKING PELLETS CONTAINING FIBER GLASS CULLET

Stanley F. Brzozowski, Coraopolis, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 902,598, May 4, 1978, abandoned, which is a division of Ser. No. 862,075, Dec. 19, 1977, abandoned. This application Mar. 5, 1979, Ser. No. 17,758

Int. Cl.[2] C03B *5/16*

U.S. Cl. 106—50 **12 Claims**

1. In a fiber glass making composition comprising a pellet of batch ingredients consisting essentially of 52 to 56 percent SiO_2, 12 to 16 percent Al_2O_3, 16 to 25 percent CaO and 6 to 13 percent B_2O_3 the improvement comprising the presence in the pellet from about 5 to about 35 percent by weight of the pellet of a fiber glass cullet having the composition recited above, said fiber glass cullet being free of organic contaminants.

4,188,229

HIGH TEMPERATURE REFRACTORY CAULKING COMPOSITION

Frederick V. Reven, Homewood, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Nov. 24, 1978, Ser. No. 963,665

Int. Cl.[2] C04B *35/14*

U.S. Cl. 106—68 **6 Claims**

3. A high temperature refractory caulking composition useful for sealing coke oven ascension pipes, Sinter furnaces, and the like, comprising:

Ingredients	% by Weight
Fluorspar	5 - 15
75% H_3PO_4	10 - 30
Alpha cristobalite	10 - 30
Alpha-quartz	10 - 50
Glassy polyphosphate having a deformation temperature of at least 500° C.	10 - 50
Bentonite clay	1 - 10
Water	An amount sufficient to form the above ingredients into a workable plastic mass.

4,188,230

SULPHUR CONCRETES, MORTARS AND THE LIKE

Jack E. Gillott; Ian J. Jordaan; Robert E. Loov, and Nigel G. Shrive, all of Calgary, Canada, assignors to Sulphur Development Institute of Canada, Calgary, Canada

Filed Sep. 12, 1978, Ser. No. 941,732

Int. Cl.[2] C04B *19/06*

U.S. Cl. 106—70 **48 Claims**

1. A hot-mouldable, water-resistant, composition comprising a mixture of mineral aggregate contaminated with swelling clay, sulphur in an amount effective to bind said aggregate and a petroleum or polyol additive effective to prevent disintegration of the composition in the presence of water.

4,188,231

METHODS OF PREPARING IRON OXIDE MORTARS OR CEMENTS WITH ADMIXTURES AND THE RESULTING PRODUCTS

Rudolph C. Valore, 618 Wyndemere Ave., Ridgewood, N.J. 07450

Filed Jun. 17, 1977, Ser. No. 807,598

Int. Cl.[2] C04B *7/35*

U.S. Cl. 106—90 **57 Claims**

1. A mortar or cement composition adapted for being mixed with water and set, said composition comprising cement, iron oxide, a functional water reducer admixture, and a thickener admixture, said functional water reducer admixture being adapted to increase the density of the mortar or cement without substantially retarding the setting thereof and without entraining substantial amounts of air, said thickener admixture being adapted to inhibit bleeding of water from the mortar or cement.

4,188,232

MINI-AGGREGATE IRON ORE IN CEMENT MATRIX

William C. Hall, Albany Turnpike, Central Valley, N.Y. 10917, and John M. Peterson, Toleman Rd., Rock Tavern, N.Y. 12575

Continuation-in-part of Ser. No. 506,274, Sep. 16, 1974. This application Jun. 24, 1977, Ser. No. 809,783

Int. Cl.[2] C04B *7/02*

U.S. Cl. 106—97 **7 Claims**

1. A method comprising the step of preparing cement such that said cement has a strength substantially independent of the slump thereof by adding iron ore concentrate mini-aggregate to said cement, the mini-aggregate being characterized by high bulk density, a blackish shining appearance, and sharp crystalline corners and flat cleavage planes, said mini-aggregate being formed of particles in major proportion of sizes no larger than would pass through an eight mesh sieve and not small enough to pass through a 150 mesh sieve and being uniformly dispersed throughout matrix, said particles being in major proportion larger than would pass through a 150 mesh sieve.

4,188,233

PROCESS FOR PREPARING HYDRAULIC BINDING MATERIALS OF HIGH BONDING CAPACITY FROM GLASSY PYROGENIC ROCKS

Zoltán Juhász, and Gyula Varju, both of Budapest, Hungary, assignors to Budapesti Muszaki Egyetem, Budapest, Hungary

Filed Apr. 13, 1978, Ser. No. 896,338

Claims priority, application Hungary, Apr. 15, 1977, BU 848

Int. Cl.[2] C04B *7/02*

U.S. Cl. 106—97 **8 Claims**

1. A process for preparing hydraulic binding materials having a high bonding capacity, comprising grinding a natural pyrogenic glass containing more than 1% of combined water, for 0.5 to 36 hours, under a higher mechanical stress than is usual during conventional fine grinding, and thereafter admixing the glass with a member selected from the group consisting of lime and portand cement.

4,188,234

CHELATION

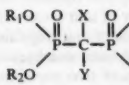
Edward G. Budnick, Scotch Plains, N.J., assignor to Plains Chemical Development Co., Scotch Plains, N.J.

Division of Ser. No. 688,388, May 20, 1976, Pat. No. 4,116,990, which is a division of Ser. No. 813,385, Feb. 28, 1969, and Ser. No. 505,471, Oct. 28, 1965, and a continuation-in-part of Ser. No. 485,624, Sep. 7, 1965, and Ser. No. 482,257, Aug. 23, 1965, said Ser. No. 688,388, is a division of Ser. No. 33,513, Apr. 20, 1970. This application Dec. 19, 1977, Ser. No. 862,194

Int. Cl.[2] C08L *27/06, 91/00*

U.S. Cl. 106—267 **23 Claims**

6. A process for the production of a protective coating composition comprising: preparing a metal complex by contacting a solution of non-alkali metal ions with a phosphorus compound having a formula selected from the group consisting of:



(a)

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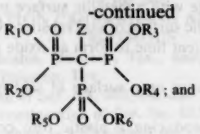
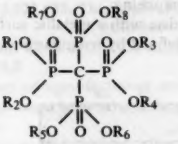


(b)



(c)

where R_1, R_2, R_3, R_4, R_5, R_6, R_7 and R_8 are selected from the group consisting of hydrogen, alkali metal and ammonium, X is selected from the group consisting of hydrogen, alkyl, alkenyl, aryl, chloroalkyl, chloroaryl, and halogen of atomic weight 35 to 80, Y is selected from the group consisting of hydroxyl, phenyl and halogen of atomic weight 35 to 80 and Z is selected from the group consisting of hydrogen, phenyl and halogen of atomic weight 35 to 80, and mixing said metal complex with a protective coating vehicle and a film-forming material to produce said protective coating composition.

8. A process according to claim **6** wherein said protective coating vehicle is turpentine and said film-forming material is selected from the group consisting of linseed oil, tung oil, soybean oil and dehydrated castor oil.

4,188,235

ELECTRODE BINDER COMPOSITION

Wilton F. Espenscheid, Princeton, N.J., and Tsoung-Yuan Yan, Philadelphia, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 703,720, Jul. 9, 1976, abandoned. This application Jan. 6, 1978, Ser. No. 867,558

Int. Cl.[2] **C08L** *95/00*

U.S. Cl. 106—278 **3 Claims**

1. A binder composition suitable for carbon electrodes which consists essentially of a homogeneous blend of (1) between about 30–45 weight percent of a highly aromatic hydrocarbon solvent component having a boiling point between about 450° F. to 1200° F. and having a hydrogen content distribution in which the H_{Ar} proton content is between about 30 and 50 percent, the H_α proton content is at least 30 percent and the H_α/H_β proton ratio is above about 1.4; (2) between about 20–35 weight percent of a highly aromatic component selected from benzene-soluble fractions of solvent-refined coal and solvent-refined wood; and (3) between about 20–40 weight percent of a highly aromatic component selected from benzene-insoluble fractions of solvent-refined coal and solvent-refined wood, wherein the binder composition has a 230° F. soft point and a specific gravity in excess of 1.2.

4,188,236

PROCESS FOR THE PRODUCTION OF A PIGMENT COMPOSITION

George H. Robertson, Cincinnati, Ohio; Alistair B. Boyd, Paisley, and Robert L. Rooney, Beith, both of Scotland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 9, 1978, Ser. No. 959,267

Claims priority, application United Kingdom, Nov. 18, 1977, 48061/77

Int. Cl.[2] **C08J** *3/12*

U.S. Cl. 106—308 Q **9 Claims**

1. A process for the production of a pigment composition in a non-dusting form which comprises contacting an aqueous dispersion of an organic pigment with

(a) a solution or dispersion of an alkaline soluble rosin acid derivative having an approximate acid value in the range 100–250 at a pH of from 8 to 11

(b) a sorbitan ester, and

(c) a water-insoluble organic carrier having a melting point below 100° C. at a temperature above the melting point of both the sorbitan ester and the organic carrier, reducing th pH to below 8, stirring the composition until the pigment, rosin derivative, sorbitan ester and organic carrier are associated in generally spherical granules, and recovering the resulting granules, the amounts of ingredients being 40–75% pigment, 5–25% rosin acid, 5–40% sorbitan ester and 5–50% carrier, all percentages being based on the weight of the total composition.

4,188,237

METHOD FOR CLEANING METAL PARTS WITH ELEMENTAL FLUORINE

Jack W. Chasteen, Kettering, Ohio, assignor to University of Dayton, Dayton, Ohio

Filed Feb. 2, 1978, Ser. No. 874,915

Int. Cl.[2] **B08B** *5/00*

U.S. Cl. 134—2 **4 Claims**

1. A method for cleaning damaged gamma prime hardened alloy parts in order to render them repair brazable comprising: (a) placing the part in a hermetically sealed passage having inlet and outlet gas ports, (b) locating a fluorocarbon resin in said passage upstream of said part, (c) heating said fluorocarbon resin to above its decomposition temperature to release elemental fluorine, (d) introducing hydrogen gas through said inlet port and flowing it past said fluorocarbon resin and, then, past said part to carry the elemental fluorine through said passage and toward said outlet port and (e) collecting the gas exiting from said outlet port.

4,188,238

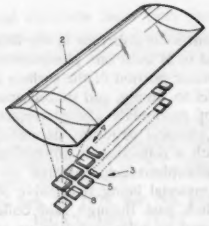
GENERATION OF ELECTRICAL ENERGY FROM SUNLIGHT, AND APPARATUS

Norman L. Boling, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jul. 3, 1978, Ser. No. 921,419

Int. Cl.[2] **H01L** *31/04*

U.S. Cl. 136—89 FC **7 Claims**



1. A process which comprises

(1) concentrating solar radiation optically with lens or reflector means to provide optically concentrated radiation and

(2) spectrally dividing said optically concentrated radiation by

(i) absorbing a portion of said concentrated radiation in a first luminescent solar collector and concentrating said absorbed radiation in the form of longer wavelength emitted luminescent radiation by the process of total internal reflection in said first luminescent solar collector,

(ii) passing the residual portion of said optically concentrated radiation through said first luminescent solar collector and, optionally, repeating steps (i) and (ii)

using one or more subsequent luminescent solar collectors in series acting on the residual optically concentrated radiation passing through the preceding luminescent solar collector,

(3) passing the concentrated emitted luminescent radiation in said first collector to a first photovoltaic cell optically coupled to a relatively small surface area of said first luminescent solar collector and passing the concentrated emitted luminescent radiation in each said subsequent luminescent solar collector, if any, to a different photovoltaic cell having a different bandgap than said first cell, which different cell is optically coupled to a relatively small surface area of the subsequent luminescent solar collector, and

(4) impinging the residual optically concentrated radiation directly on a still different photovoltaic cell responsive to at least a portion of said residual radiation.

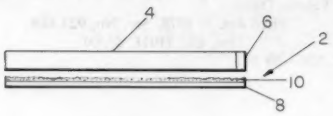
6. An arrangement of apparatus for converting solar energy to electrical energy which comprises a lens or mirror to receive and collect sunlight, arranged to impinge the optically concentrated sunlight on a face surface of a first luminescent solar collector optically coupled to a photocell means for generating electrical energy, and in series with the aforesaid luminescent solar collector a different photocell means having a different bandgap than the first mentioned photocell means, arranged to receive residual optically concentrated sunlight, and optionally interposed between said first solar collector and said different photocell means one or more luminescent solar collectors, each optically coupled to a different photocell means.

4,188,239

LUMINESCENT SOLAR COLLECTOR STRUCTURE

Norman L. Boling, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 30, 1978, Ser. No. 965,446
Int. Cl.[2] H01L *31/04*
U.S. Cl. 136—89 FC **3 Claims**



1. A luminescent solar collector in the form of a flat plate, optically coupled to at least one photovoltaic cell on a relatively small or minor portion of the surface area thereof; and essentially parallel to, facing, and spaced apart from said collector a layer of particulate phosphorescent material of a rough, diffusing physical structure, deposited on and backed by a mirror which is reflective of luminescent radiation produced by said phosphorescent material on activation, said phosphorescent material being responsive to solar radiation wavelengths which pass through said collector when said collector is exposed to solar radiation or radiation of solar wavelengths, wherein said luminescent solar collector contains at least one luminescent species which can be activated by luminescent emission from said phosphorescent material.

4,188,240

METHOD FOR PRODUCING A METAL LAYER BY PLATING

Akira Yoshio, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 5, 1978, Ser. No. 939,194
Claims priority, application Japan, Sep. 5, 1977, 52-106445
Int. Cl.[2] C23F *7/02*; B29D *17/00*
U.S. Cl. 148—6.14 R **6 Claims**

1. A method for producing a metal layer by plating comprising the steps of:

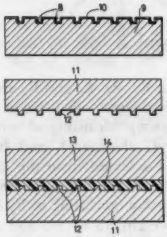
providing a substrate with a metallic surface to be plated;

oxidizing said metallic surface of said substrate with hypohalogenite for sufficient time to form an oxide parting layer thereon; and

plating a metallic layer on a surface of said oxide parting layer.

5. A method for producing a plastic disc containing recorded information comprising:

producing a master disc with a metallic surface and having said information defined by irregularities of said surface;



oxidizing said metallic surface with hypohalogenite for sufficient time to form an oxide parting layer thereon;

plating a metal layer on said oxide parting layer;

separating said metal layer from said master disc at said parting layer; and

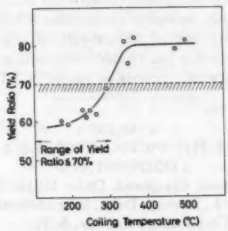
pressing a surface of said metal layer against a plastic disc material whereby a plastic disc is formed with a surface of said plastic disc having irregularities which are a replica of said information.

4,188,241

METHOD FOR PRODUCING HIGH TENSILE STRENGTH, HIGH DUCTILITY, LOW YIELD RATIO HOT ROLLED STEEL SHEET

Kunio Watanabe, and Yoshio Hashimoto, both of Sakai, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Nov. 30, 1978, Ser. No. 964,889
Claims priority, application Japan, Dec. 6, 1977, 52/145705
Int. Cl.[2] C21D *9/46, 9/48*
U.S. Cl. 148—12 F **6 Claims**



1. A method for producing a plain low carbon hot rolled steel strip or sheet having a low yield ratio, not higher than 70%, high ductility and high tensile strength comprising: hot rolling a steel slab with its finishing temperature not lower than the Ar_3 transformation temperature, cooling the hot rolled sheet strip from a starting temperature not lower than Ar_3 transformation temperature, and coiling the hot rolled strip at a temperature not higher than 300° C.

4,188,242

COMBINATION CARBURIZING AND BORONIZING METHODS

Stanley R. Scales, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Continuation of Ser. No. 803,906, Jun. 6, 1977, abandoned, which is a continuation of Ser. No. 622,929, Oct. 16, 1975, abandoned, which is a division of Ser. No. 387,566, Aug. 10, 1973, Pat. No. 3,922,038. This application Jun. 13, 1978, Ser. No. 915,094

Int. Cl.[2] C21D *9/22*; E21B *13/00*

U.S. Cl. 148—15.5 5 Claims

1. The method of manufacturing steel articles requiring a strong and tough wear resistant surface, said method comprising the steps of:

first, carburizing said surface, after said article has been formed, in a carbon rich environment in a furnace at a time and temperature to produce a carburized case of selected depth;

second pack boronizing said carburized case in a boron compound in a furnace at a time and temperature to produce a boronized case;

third, hardening said carburized case by quenching after heating to a temperature and cooling at a rate to produce martensite; and

fourth, tempering said carburized case by heating to a temperature to produce tempered martensite;

whereby the wear resistant boronized surface has a tough and strong supporting base to sustain large loads and avoid brittle fracture.

4,188,243

METHOD AND APPARATUS FOR HEAT-TREATING METALLIC MATERIAL

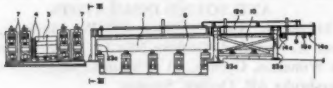
Nobuhiro Takahashi, Fukuyama, and Kenichi Hirata, Okayama, both of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 2, 1978, Ser. No. 874,665

Claims priority, application Japan, Feb. 8, 1977, 52/12064

Int. Cl.[2] C21D *1/00*

U.S. Cl. 148—155 2 Claims



1. A method of heat treating a metallic material by conveying said material through a heat treating zone, wherein two cars are provided respectively at the entry and delivery sides of said heat treating zone, each of said cars having a dummy attached thereto, comprising the steps of gripping said metallic material at the forward and rear ends thereof by means of said dummies, simultaneously driving the car at the entry side at the rear end of said metallic material in the direction of movement of the metallic material through the heat treating zone and applying braking to the car at the delivery side at the front end of said metallic material, whereby the car at the front end is pushed forward with the metallic material at a steady speed through the heat treating zone by the car at the rear end, thereby subjecting said metallic material to uniform heat treatment.

4,188,244

METHOD OF MAKING A SEMICONDUCTOR LIGHT-EMITTING DEVICE UTILIZING LOW-TEMPERATURE VAPOR-PHASE DEPOSITION

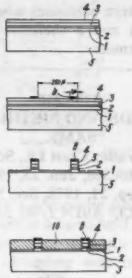
Kunio Itoh, and Morio Inoue, both of Takatsuki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 674,723, Apr. 6, 1976, abandoned. This application Oct. 2, 1978, Ser. No. 947,419

Claims priority, application Japan, Apr. 10, 1975, 50-43967

Int. Cl.[2] H01L *21/203, 21/94*

U.S. Cl. 148—174 6 Claims



1. A method of making a semiconductor light-emitting device comprising the following steps:

epitaxially forming at least a light-emitting active region and an electrode-contacting region on a semiconductor substrate,

etching said epitaxially formed regions in a manner that selected parts of said regions are etched away forming one or more recesses, the bottoms of which reach at least a depth of the lower junction of said light-emitting active region,

depositing a high resistivity polycrystalline semiconductor at a relatively low temperature in said one or more recesses to form a polycrystalline semiconductor region, wherein said deposition is done by one method selected from the group consisting of vapor phase reaction, vacuum deposition, sputtering and molecular beam growth, and

forming a metal electrode layer onto the surface of said electrode contacting region, extending onto the surface of said high resistivity polycrystalline semiconductor region.

4,188,245

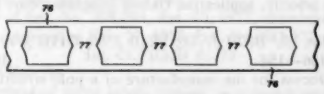
SELECTIVE OPEN TUBE ALUMINUM DIFFUSION

Mike F. Chang, Liverpool; Alfred Roesch, Auburn, and Richard W. Kennedy, Skaneateles, all of N.Y., assignors to General Electric Company, Auburn, N.Y.

Filed Sep. 18, 1978, Ser. No. 943,451

Int. Cl.[2] H01L *21/22*

U.S. Cl. 148—188 6 Claims



1. A method for simultaneously forming a relatively shallow blanket diffusion and a relatively deeper selective isolation diffusion in a semiconductor comprising:

providing a semiconductor wafer;

selectively applying an aluminum pattern to a first surface of said wafer only to those areas under which said relatively deep isolation diffusion is desired;

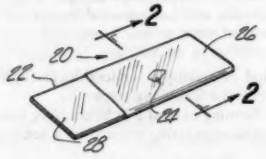
inserting said wafer into an open diffusion tube;
introducing a flow of inert gas into a first end of said diffusion tube and exhausting said gas from a second end of said tube;
heating said tube to a temperature sufficient to cause aluminum to diffuse from said pattern directly into the bulk of said wafer underlying said pattern to form said deep isolation diffusions, and further to vaporize said aluminum and to diffuse said aluminum into the surface of said wafer not covered by said pattern to form said blanket diffusion; and
introducing a preselected percent of oxidizing gas into said gas after said blanket diffusion has been initiated to stop the further vaporization of said aluminum while said diffusion from said pattern continues whereby a deep selective isolation diffusion and a shallow blanket diffusion are simultaneously formed.

4,188,246

MICROSCOPE SLIDE AND METHOD FOR MAKING SAME

Julius Lipshaw, 23040 Valley Crest La., Southfield, Mich. 48034

Division of Ser. No. 809,368, Jun. 23, 1977, abandoned. This application Sep. 21, 1978, Ser. No. 944,579
Int. Cl.[2] A01N *1/00, 3/00*
U.S. Cl. 156—57 **9 Claims**



1. A process of preparing a microscope slide without any separate cover plate consisting essentially of applying a specimen to a slide plate of a transparent solid material which is of substantially uniform thickness, applying over the specimen and to the slide plate a liquid coating of a transparent plastic material of a type which will adhere itself to the slide plate with the liquid coating encircling and overlying at least the entire specimen on the plate and an area on the plate immediately adjacent the specimen, and subsequently converting the liquid coating to a solid coating which has a substantially flat exterior surface and is continuous over at least the specimen on the plate, permanently adheres to the plate, and hermetically seals the specimen on the plate so as to provide a microscope slide which does not have a separate cover plate of a clear transparent material overlying the specimen and fixed to the slide plate.

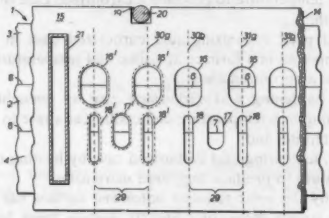
4,188,247

MANUFACTURE OF MAGNETIC TRANSDUCING HEADS

Peter C. Ridgway, Staines, and Derek F. Case, Sunbury on Thames, both of England, assignors to Data Recording Instrument Company Limited, Staines, England

Filed Mar. 6, 1978, Ser. No. 883,911
Claims priority, application United Kingdom, Mar. 15, 1977, 10797/77
Int. Cl.[2] B32B *31/00;* **B24B** *1/00;* **G11B** *5/42*
U.S. Cl. 156—154 **10 Claims**

1. A process for the manufacture of a pole structure for a magnetic transducing head, the process comprising:
providing a structure comprising first and second magnetic members, each member including a planar gap defining face and said members being located relative to one another with the gap defining faces in opposed relationship and separated by a non-magnetic gap filled with non-magnetic material, and said structure including an initial surface extending over both of said magnetic members and across the non-magnetic material in the gap between said members;
applying masking means to said initial surface to mask a first region of said initial surface leaving exposed a second region of said initial surface, said second region extending over a part of said first magnetic member and including an intersection with a part of the gap defining face of said first magnetic member:
directing a stream of abrasive particles toward said initial surface to produce at the exposed second region a recess including a side wall so inclined that an edge along an intersection between the side wall and the gap defining face of said first member intersects the initial surface at an initial location in said surface and at an angle to a direction perpendicular to said surface;
removing the masking means from said first region;



thereafter removing material substantially uniformly from said initial surface to produce a new surface so that due to said inclination of said edge the new surface has an intersection with said edge at a new location displaced from said initial location in a direction aligned with the surface; and
continuing to remove material until the new location is located at a desired position in the new surface of the structure.

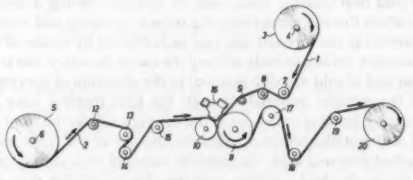
8. A process as claimed in claim 1 in which the members are of ferrite bonded together at the non-magnetic gap by a first glass having a first softening temperature; and in which the recess is filled with a second glass having a second softening temperature lower than said first temperature prior to removing the material from the previously masked first region of the structure.

4,188,248

PRODUCING A CONTINUOUS FLEXIBLE SHEET COVERING MATERIAL FOR WRAPPING HEAT, COLD AND SOUND INSULATION

Ulf J. Millgardh, Stora Mellosa; Ulf W. Lindberg, Orebro; Weimar A. Anneflod, Orebro; Nils H. Werner, Orebro, and Björn Wimelius, Orebro, all of Sweden, assignors to Orebro Pappersbruks AB, Orebro, Sweden

Filed Mar. 7, 1978, Ser. No. 884,299
Claims priority, application Sweden, Mar. 14, 1977, 7702865
Int. Cl.[2] B32B *31/08*
U.S. Cl. 156—164 **4 Claims**



1. A method of producing a continuous, sheet-like, flexible

covering material intended for wrapping round heat, cold or sound insulation on piping and the like, said multilayer laminate being composed of at least two layer groups, bonded together by a binder, which also forms the outer part of the finished material as it is rolled up, said at least two layer groups including a first layer group containing a supporting layer of kraft paper and a second layer group of highly extensible kraft paper, said method comprising the steps of:

keeping said first layer group containing the supporting layer of kraft paper under minimum tensional stress in the order of magnitude of 1.5 N/cm sheet width,

providing said first layer group with a polyethylene layer on its outwardly facing surface while simultaneously providing said first layer group on its inside surface with a bonding material layer,

exposing said layer of highly extensible kraft paper of said second layer group which is exposed to a high tensional stress during lamination with said first layer group by utilizing at least a quarter of the stretching ability of the highly extensible kraft paper,

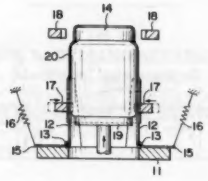
said process further comprising applying a polyethylene layer to both sides of the highly extensible kraft paper and passing together with the first layer group said second layer group into a roll nip such that both layer groups are pressed together with the extensible paper in a stretched condition within its elastic limits to produce a laminate having a tendency to curl up as a result of the contracting tendency caused by the extensible paper striving to regain its original shape.

4,188,249

PACKAGE INCLUDING AN ELASTIC CONTAINER PROTECTOR AND A METHOD AND MACHINE FOR FITTING THE PROTECTOR

Masaaki Fujio, Suita, Japan, assignor to Fuji Seal Industry Co., Ltd., Japan

Filed Apr. 3, 1978, Ser. No. 892,854
Claims priority, application Japan, Apr. 5, 1977, 52/38104
Int. Cl.[2] B32B *31/00*; B29C *19/00*; B29D *3/00*
U.S. Cl. 156—165 **6 Claims**



1. A method for putting a container protector comprising an elastic film tube over a part of a container, the circumference of which is larger than that of the elastic film in its unstressed state comprising:

putting the film tube over a plurality of guide plates which are arranged around an axis and are movable inwards and outwards,

stretching the film tube by moving said guide plates outwardly,

inserting the part of the container inside the stretched film tube,

releasing the film tube so that it grips part of the container, and

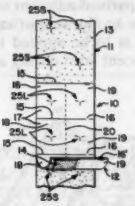
gripping the film tube onto the container with gripping members while removing said guide plates.

4,188,250

METHOD OF MAKING A COMPOSITE WEB

Joseph J. Grass, Kettering, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 758,296, Jan. 10, 1977, abandoned. This application Feb. 27, 1978, Ser. No. 881,971
Int. Cl.[2] B32B *31/18*
U.S. Cl. 156—253 **4 Claims**



1. Method of making a composite web of pressure sensitive labels adapted to be used in a hand-held label applying apparatus, comprising the steps of: providing a composite web including a longitudinally extending web of supporting material having a release coating thereon and printable label material having pressure sensitive adhesive thereon, the adhesive being releasably adhered to the release coating on the supporting material web, severing the label material at longitudinally spaced laterally extending lines to provide a series of labels carried on the supporting material web, partially severing the web of label material along a longitudinally extending line between the side edges of the label material to provide each label with first and second label parts with only the first label parts having a coating of the adhesive with the adhesive on the first label parts being present in an amount and distribution to hold the label securely to merchandise and the second label parts being connected to the supporting material web only through the longitudinally extending line of partial severing, the improvement wherein each line of lateral severing is substantially continuous and extends substantially completely across the entire width of the label material but defines a frangible portion connecting together the second label parts of adjacent labels for keeping the second label parts close to the supporting material web but enabling a label which is to be applied to be readily pulled apart from the next adjacent label during application of the label without knife cutting, the first and second label parts being held together relatively securely at the longitudinal line of partial severing to prevent the second label part from being accidentally detached from the related first label part until ready to be detached and removed by the user, the force required to pull apart the second label parts of adjacent labels being substantially less than the force required to pull apart the first and second parts of each label.

4,188,251

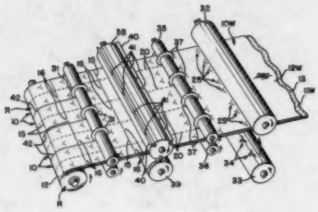
METHOD OF DISPENSING LABELS

Joseph J. Grass, Kettering, Ohio, assignor to Monarch Marking Systems, Inc., 05, Dayton, Ohio

Division of Ser. No. 758,296, Jan. 10, 1977, abandoned. This application Feb. 27, 1978, Ser. No. 881,972
Int. Cl.[2] B32B *31/18*
U.S. Cl. 156—248 **16 Claims**

16. Method of using labels carried on a composite web including a longitudinally extending web of supporting material having a release coating thereon and printable label material having pressure sensitive adhesive thereon, the adhesive being releasably adhered to the release coating on the supporting material web, the label material being severed at longitudinally spaced laterally extending lines to provide a series of labels carried on the supporting material web, the label material being partially severed along a longitudinally extending line

between side edges of the label material to provide each label with first and second label parts with only the first label parts having a coating of the adhesive with the adhesive on the first label parts being present in an amount and distribution to hold the label securely to merchandise and the second label parts being connected to the supporting material web only through the longitudinally extending line of partial severing, wherein each line of lateral severing is substantially continuous and extends substantially completely across the entire width of the label material but defines a frangible portion connecting together the second label parts of adjacent labels for keeping the second label parts close to the supporting material web but enabling a label which is to be applied to be readily pulled apart from the next adjacent label during application of a label



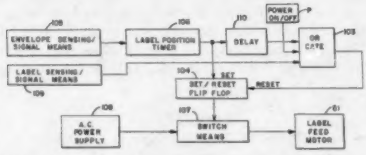
without knife cutting, comprising the steps of: printing a first price on the first label part and a second and lower price on the second label part, drawing the supporting material web around a relatively sharp bend until the just printed label is advanced to a position at which only a trailing marginal end portion is adhered to the supporting material web and the label is in label applying relationship with respect to a label applicator, applying the label to merchandise using the label applicator while pulling the trailing marginal end portion of the label away from the supporting material web and simultaneously pulling and thereby tearing the frangible portion which connects the second label part of the label which is being applied to the second label part of the next adjacent label, and thereafter tearing the second label part apart from the first label part.

4,188,252

LABEL POSITIONING AND APPLYING APPARATUS

Frank H. Brown, Norwich, N.Y., assignor to Automecha Ltd., Oxford, N.Y.

Filed Aug. 31, 1977, Ser. No. 829,516
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—361 **9 Claims**



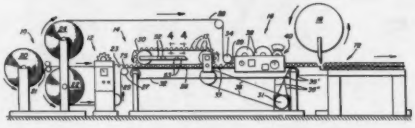
1. A machine for applying labels to envelopes and the like, comprising: a frame having upstanding, generally parallel side walls and defining a bottom, a top, a front and a back; a label affixing station at the bottom of the machine near the front; envelope feed means at the bottom for feeding an envelope or the like through the machine and past the label affixing station; label storage means at the top of the machine for storing a plurality of labels on a carrier web; label feed chute means at the front of the machine; label feed means for moving the web and thus the labels down the chute means and past the label affixing station; label stripping means at the label affixing station for separating labels from the web; and electronic control means for controlling feed of envelopes and labels past the label affixing station whereby accurate registry between the labels and envelopes is obtained, said control means including switch means connecting said label feed means to a power supply, switch control means controlling said switch means, reset means connected to said switch control means to cause said switch control means to actuate/deactuate said label feed means; envelope sensing means for sensing the approach of an envelope or the like to the label affixing station and operative to initiate feeding of labels, label sensing means for sensing movement of the labels toward the label affixing station, said label sensing means being connected to said switch reset means to operate said switch control means to terminate feeding of labels after a label has been advanced for application to an envelope or the like, a label position timer connected to said envelope sensing means, delay means associated with said label position timer for delaying a signal produced by said label sensing means, and redundant delay means connecting said label position timer to said switch control reset means for further delaying a signal produced by said label position timer a predetermined time, said further delayed signal being supplied to said reset means to reset said switch means after said predetermined time whether or not a label has been sensed by said label sensing means, said reset means being controlled via both said label sensing signal means and said redundant delay means to terminate the feeding of labels after a predetermined time even if advancement of a label is not actually sensed by said label sensing means.

4,188,253

MACHINE FOR THE FABRICATION OF PLASTICBOARD

Henry D. Swartz, Chestnut Hill, Mass., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 754,504, Dec. 27, 1976, Pat. No. 4,132,581.
This application Jul. 3, 1978, Ser. No. 921,501
Int. Cl.[2] B29C *17/00;* B31F *1/20*
U.S. Cl. 156—361 **7 Claims**



1. A machine for the fabrication of corrugated plasticboard comprising:

(a) a first means for (i) heating selectively apexes on a first side of said corrugated web from within corrugations of said corrugated web to a heat fusion temperature, (ii) conveying said corrugated web while said apexes on said first side of said corrugated web are in pressure contact with a first web heat fusible thereto and (iii) forming a bond between said corrugated web and said first web;

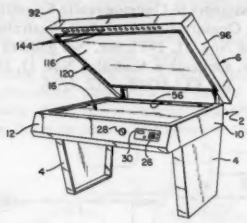
(b) a second means for (i) heating a second web to a heat fusion temperature, (ii) conveying said second web in pressure contact with apexes heat fusible thereto on a second side of said corrugated web and (iii) forming a bond between said second web and said apexes; and

(c) means for synchronizing the speeds both of conveying by said first means and of conveying by said second means.

4,188,254
VACUUM PRESS

Lyle D. Hemperly, Jr., Naugatuck, Conn., assignor to Seal Incorporated, Naugatuck, Conn.

Filed Jul. 24, 1978, Ser. No. 927,331
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—382 18 Claims

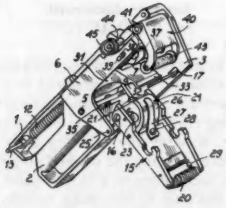


1. A vacuum press comprising:
a work support assembly including a substantially rigid surface for supporting a workpiece;
a cover assembly disposed above and hingedly connected to said work support assembly so as to be movable into and out of engagement with said work support assembly, said cover assembly comprising a frame defining an opening, a pliable, air-impermeable sheet extending across said opening and secured at its edges to said frame, and electrical heater means for heating said workpiece disposed within said opening above said pliable sheet;
means carried by said cover assembly for sealing together said work support assembly and said cover assembly when mutually engaged so as to provide an airtight chamber between said surface and said pliable sheet;
means for evacuating said chamber so that the atmospheric pressure exterior of said chamber will force said pliable sheet towards said surface and thereby compress a workpiece supported on said surface;
cooling means including a blower for circulating a flow of cool air through said cover assembly over said pliable sheet;
control means for operating said electrical heater means, said evacuating means and said blower so that a workpiece captivated in said chamber may alternately be heated under compression and cooled under compression.

4,188,255
PRICE LABELLING APPARATUS

Guido Gottardo, Marghera, Italy, assignor to Tovel S.p.A., Mestre, Italy

Filed Feb. 23, 1978, Ser. No. 880,608
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—384 6 Claims

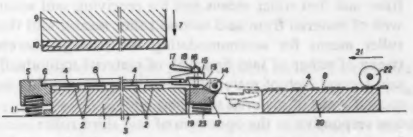


1. A price labelling apparatus comprising: a movable unit and a fixed unit respectively rigid with a movable control arm and a fixed control arm, said units being in engagement with a label carrying web entrainment device, with a printing head, bearing print characters with an inking device, with supports for said printing head, means adapted to select the print characters, means for positioning the stamp on the labels; said apparatus being characterized in that it comprises a lever brake, centrally and pivotally mounted to a pivot pin rigid with said fixed unit, and having a first end adapted to exert pressure on the label web, and a second opposite located end at a position opposing an adjustable projection element extending from said movable unit, said element biassing said second end of said lever brake such as to cause said first end to be maintained biased against said label carrying web.

4,188,256
APPARATUS FOR MANUFACTURING IDENTIFICATION PLATES HAVING INDENTED RETROREFLECTIVE CHARACTERS

Kurt Schwab, Innsbruck, Austria, assignor to D. Swarovski & Co, Glasschleiferei, Wattens, Austria

Filed Aug. 16, 1977, Ser. No. 825,025
Claims priority, application Austria, Aug. 27, 1976, 6380/76
Int. Cl.[2] B32B *31/20*
U.S. Cl. 156—386 4 Claims



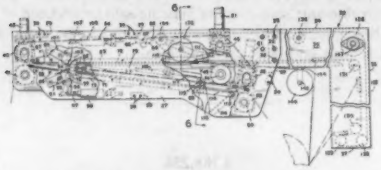
1. Apparatus for manufacturing identification plates having imprinted thereon recessed characters covered with retroreflective material comprising a male compression die member having thereon upstanding male die elements shaped in the form of characters to be imprinted on said identification plates, alignment means for enabling a plate blank from which said identification plate is to be made to be positioned relative to said male compression die member in accurate alignment over said male compression die elements, said alignment means operating to permit a plate blank to be accurately realigned with said male compression die member after said plate blank has been pressed thereover to receive thereon retroreflective material formed in the shape of characters to be imprinted on said identification plate, said retroreflective material having an adhesive layer on one side thereof and having been first placed over said male compression die elements with said adhesive side up to permit said material to be adhered to said plate blank, and after said plate has been subsequently subjected to a pressing operation to enhance adherence of said retroreflective material thereto and to remove air bubbles therefrom, compression means operating in cooperation with said male compression die member for stamping in said plate blank indentations shaped in the form of said male die elements after said plate blank has been replaced over said male die member in accurate alignment therewith by operation of said alignment means, and clamping means designed to clamp in fixed engagement therein said plate blank and mounted for pivotal motion about an axis extending generally parallel to one side of said plate blank for moving said plate blank between said aligned position over said male die member and a position at which said pressing operation is performed, said clamping means being pivotally mounted to a frame which is fixed relative to said male compressive die member in directions extending transversely to the direction of movement of said compression means but which is spring mounted in directions extending parallel thereto.

4,188,257

WEB HANDLING APPARATUS

Alan D. Kirkpatrick, Martinsville, N.J., assignor to Corrugated Development, Inc., Fairfield, N.J.

Filed Jan. 23, 1978, Ser. No. 871,557
Int. Cl.[2] B65H *19/08, 19/16*
U.S. Cl. 156—504 **27 Claims**



1. Web handling apparatus for accelerating a first web of material to the speed of a moving second web of material, said apparatus comprising:

first roller means for accommodating the passage therebetween of said first web of material;

second roller means for accommodating the passage therebetween of said second web of material;

third roller means for receiving said first web of material from said first roller means and for receiving said second web of material from said second roller means, said third roller means for accommodating the passage therebetween of either of said first web of material individually, said second web of material individually or said first and second webs of material together; and

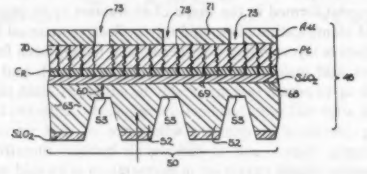
means responsive to the operation of said third roller means for driving said first roller means to accelerate said first web of material to said speed of said second web of material.

4,188,258

PROCESS FOR FABRICATING STRAIN GAGE TRANSDUCER

Carlyle A. Mounteer, Irvine, and Ronald L. Poteet, San Juan Capistrano, both of Calif., assignors to Gulton Industries, Inc., Princeton, N.J.

Filed May 18, 1978, Ser. No. 906,955
Int. Cl.[2] H01L *21/306;* C23F *1/02*
U.S. Cl. 156—628 **13 Claims**



1. A process for fabricating a strain gage transducer on a substrate comprising the steps of:

forming a layer of a platinum alloy strain gage material on said substrate;

forming an overlying gold layer on said platinum alloy strain gage material;

defining a strain gage pattern in said gold layer;

diffusing gold from said gold layer into said platinum alloy strain gage material so as to make said platinum alloy strain gage material receiving said gold more etchable;

forming a mask on said gold layer which defines leads for connecting with said strain gage pattern;

etching said gold layer and said layer of platinum alloy strain gage material to form strain gages and leads;

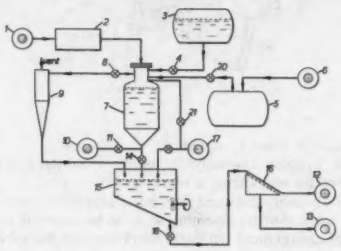
whereby platinum alloy strain gages with gold leads are formed on said substrate by etching.

4,188,259

RECOVERY OF FIBRE FROM LAMINATED CARTON BOARDS

Heikki Mamers, Seaford, and John E. Rowney, St. Albans, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Nov. 11, 1977, Ser. No. 850,519
Claims priority, application Australia, Nov. 11, 1976, 8104/69
Int. Cl.[2] D21B *1/32, 1/36*
U.S. Cl. 162—4 **30 Claims**



1. A method for recovering cellulosic fibres from a laminate having a cellulosic fibre layer and a layer of thermoplastic material, which method comprises the steps of:

(i) placing the laminate in contact with a pulping liquor, to provide a liquor-laminate system,

(ii) pressurizing and heating the liquor-laminate system to a temperature greater than or equal to the softening point of the thermoplastic material and maintaining this temperature for a time to sufficiently weaken the laminate structure,

(iii) cooling the liquor-laminate system to a temperature below the softening point of the thermoplastic material,

(iv) subjecting the cooled liquor-laminate system to defibration forces to provide a mixture of thermoplastic fragments and cellulosic fibres, and

(v) separating the thermoplastic fragments from the cellulosic fibres to thereby recover the cellulosic fibres.

4,188,260

LOW EFFLUENT PULP MILL, BLEACH PLANT OPERATION

Gordon Rowlandson, Birmingham, Ala.; Douglas W. Reeve, Orton, and W. Howard Rapson, Scarborough, both of Canada, assignors to Erco Envirotech Ltd., Islington, Canada

Division of Ser. No. 794,240, May 5, 1977, Pat. No. 4,104,114.
This application Mar. 1, 1978, Ser. No. 882,362
The portion of the term of this patent subsequent to Aug. 2, 1994, has been disclaimed.
Int. Cl.[2] D21C *11/12*
U.S. Cl. 162—16 **5 Claims**

1. A bleached kraft pulp mill process, including the steps of:

(a) digesting cellulosic fibrous material in a pulping liquor containing sodium hydroxide and sodium sulphide as the active pulping chemicals to form brown stock and dilute black liquor, washing the resulting brown stock with a first wash water, passing the washed pulp through screens and cleaners and thence to a bleach plant;

(b) subjecting the pulp to bleaching, caustic extraction and washing operations in said bleach plant to result in bleached pulp of the required brightness and purity;

(c) removing two effluents from the bleach plant consisting of an alkaline effluent and an acid effluent and utilizing part of said alkaline effluent as part of said first wash water;

(d) passing said dilute black liquor from the digestion step to sextuple effect black liquor evaporators to which heating steam is fed and recovering condensates from said evaporators;

(e) passing concentrated black liquor from the evaporators to a recovery furnace wherein organic materials present in the concentrated black liquor are burned and a smelt containing sodium carbonate, sodium sulphide, sodium chloride and sodium sulphate is formed;

(f) forming white liquor containing regenerated pulping chemicals from the smelt, separating substantially pure solid sodium chloride from the white liquor by an evaporation procedure, recovering condensed water from the evaporation, diluting the concentrated white liquor resulting from the evaporation procedure to the required pulping liquor concentration using the remainder of said alkaline filtrate, recycling said latter pulping liquor to said digestion step for use as at least part of the pulping liquor therein and discharging said condensed water;

(g) subjecting hotwell condensate, flash heat double evaporator condensate and sextuple surface condenser condensate from said sextuple effect evaporators along with turpentine underflow from said digestion step to steam stripping to remove therefrom BOD-causing volatile organic material, recovering the stripped volatile organic material and utilizing the stripped condensate as a source of water for the process; and

(h) passing fifth and sixth evaporator condensate for use in the formation of white liquor from the smelt; and

(i) passing said acid filtrate for use in the formation of white liquor from the smelt.

4,188,261

METHOD OF IMPROVING THE HOMOGENEITY OF LIGNOCELLULOSE CONTAINING MATERIAL

Sture O. E. Backlund, Sundsvall, Sweden, assignor to SCA Development Aktiebolag, Sweden

Continuation-in-part of Ser. No. 673,691, Apr. 5, 1976, abandoned. This application Aug. 22, 1977, Ser. No. 826,568

Claims priority, application Sweden, Apr. 18, 1975, 7504526

Int. Cl.[2] **D21C** *3/22, 7/12*

U.S. Cl. 162—42 **6 Claims**

1. A method for improving the homogeneity of ligno-cellulose containing materials during digestion thereof in a digester, which comprises charging said ligno-cellulose materials and a cooking liquor into said digester, drawing off a portion of said cooking liquor from said digester, heating said drawn off cooking liquor, dividing said heated cooking liquor into a first portion and a second portion, returning said first portion of said heated cooking liquor to the top of said digester, returning said second portion of said heated cooking liquor to the bottom of said digester, and causing boiling to occur in said digester for a period of from about 2 to 20 minutes solely by terminating the return of said first portion of said heated cooking liquor to the top of said digester, whereby an increased amount of said heated cooking liquor greater than the amount of said second portion of said heated cooking liquor is returned to the bottom of said digester, said increased amount of said heated cooking liquor being from about 1 to 15 m^3/min and comprising the total amount of said cooking liquor drawn off from said digester.

4,188,262

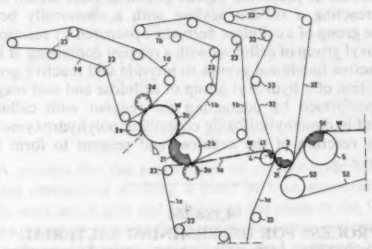
METHOD FOR DEWATERING PAPER IN A PAPER MACHINE PRESS SECTION

Matti Kankaanpää, Tapiola, Finland, assignor to Valmet, Finland

Continuation-in-part of Ser. No. 544,952, Jan. 23, 1975, abandoned, which is a continuation-in-part of Ser. No. 310,805, Nov. 30, 1972, abandoned. This application Feb. 23, 1977, Ser. No. 771,149

Int. Cl.[2] **D21F** *2/00, 3/04*

U.S. Cl. 162—205 **5 Claims**



1. A method in a paper machine press section for dewatering a paper or paperboard web and for feeding said web from a forming wire of said paper machine through the press section, the web being substantially all the time supported by the surface of a felt or a roll comprising the steps of:

urging a pick-up felt by means of a pick-up suction roll against said web lying on said forming wire;

detaching the web from said forming wire and adhering the web by suction to the surface of said pick-up felt on which the web during its travel onwards is kept on an area defined by a suction sector of said pick-up roll;

detaching the web from said pick-up felt and transferring the web onto a transfer felt of a transfer felt loop while wrapping a transfer roll, said transfer roll operating inside the transfer felt loop contiguous to said pick-up roll;

passing the web lying on the surface of the transfer felt to a first dewatering press nip of the press section, which nip is formed by an upper suction press roll and cavernous surface lower press roll, wherein the cavernous roll operates inside said transfer felt loop and the suction press roll operates inside its own felt loop formed by a suction roll felt, said suction roll felt only lapping said suction press roll and not contacting said web prior to said web reaching said first dewatering press nip; pressing the web in said first press nip to dewater the web in two directions partly towards the suction roll whereby the water is removed through the suction roll felt and partly towards the cavernous surface roll so that the water is also removed from the web through the transfer felt;

adhering the web to the suction roll felt surface due to the effect of the suction prevailing inside said suction press roll;

transferring the web adherent to the suction roll felt surface to the second dewatering press nip of the press section, said second nip being formed by the suction roll of said first nip and by a smooth surface press roll;

pressing the web in said second nip so as to dewater the web only towards said suction roll whereby the water removed from the web is transferred into the suction roll felt;

detaching the web from said suction roll felt utilizing the adhesion force of the surface of said smooth surface press roll and adhering the web on said surface; and

transferring the web being adherent to the surface of said smooth surface roll to a following web treatment phase.

4,188,263

CARRIER-BOUND ACYLASES

Hans-Leo Hulsmann, Wetter, Fed. Rep. of Germany, and Gustav Renckhoff, deceased, late of Witten, Fed. Rep. of Germany (by Brunhilde Renckhoff nee Grave, heir and legal representative), assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Jan. 25, 1978, Ser. No. 872,277

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1977, 2703703

Int. Cl.[2] C07G *7/02;* **C12D** *13/06*

U.S. Cl. 439—179 **2 Claims**

1. Process of preparing carrier-bound acylase which comprises reacting a soluble acylase with a chemically bound reactive group of a cellulose derivative prepared by reaction of a hydroxyl group of cellulose with a reagent containing at least two reactive functional groups to provide said reactive group, the reaction of a hydroxyl group of cellulose and said reagent being performed by contacting the reagent with cellulose dissolved in dimethylsulfoxide containing polyhydroxymethylene for reaction of the cellulose and reagent to form said derivative.

4,188,264

PROCESS FOR DETERMINING BACTERIAL ENDOTOXIN AND REAGENTS USED THEREFOR

Sadaaki Iwanaga, Suita; Takashi Morita, Takatsuki; Shin Nakamura; Kenji Takahashi, both of Inuyama, and Makoto Niwa, Sakai, all of Japan, assignors to Seikagaku Kogyo Co. Ltd., Tokyo, Japan

Filed Nov. 1, 1977, Ser. No. 847,582

Claims priority, application Japan, Jun. 14, 1977, 52/70335

Int. Cl.[2] G01N *31/14*

U.S. Cl. 23—230 B **6 Claims**

1. A process for determining a bacterial endotoxin, which comprises contacting an assay sample with (A) a material selected from the group consisting of an amoebocyte lysate of horseshoe crab and a pro-clotting enzyme separated from the lysate, and (B) a peptide-type substrate of the formula

$$R_1—Gly—Arg—R_2$$

wherein R_1 represents a member selected from the group consisting of an L-amino acid moiety whose N-terminal is protected by a protective group, a peptide moiety consisting of an L-amino acid and protected by a protective group at its N-terminal, a D-amino acid substituted L-amino acid moiety, and a D-amino acid substituted peptide moiety consisting of an L-amino acid, and is bonded to the amino group of the glycine moiety expressed by Gly through a peptide bond; and R_2 represents a chromogenic moiety which is bonded to the C-terminal of an L-arginine moiety expressed by Arg through an acid amide bond and/or ester bond and can be enzymatically hydrolyzed in the presence of the material (A) and the endotoxin to liberate R_2H, and/or its mineral acid salt, and detecting the resulting R_2H in which R_2 is as defined above.

4,188,265

PORTABLE INCUBATOR

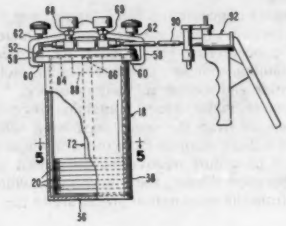
Harold D. Larro, Tigard, Oreg., assignor to Almore International, Inc., Beaverton, Oreg.

Filed Feb. 15, 1978, Ser. No. 877,921

Int. Cl.[2] C12K *1/10*

U.S. Cl. 435—313 **16 Claims**

16. In a portable incubator unit having an open top jar provided with a circular flange surrounding the open top thereof, a lid for covering the jar, the lid having a generally flat lower surface, there being a conduit above the upper surface of the lid and the lid having a hole therethrough; means on the lid for placing the hole and thereby the interior of the jar in fluid communication with the conduit at a location thereon intermediate its ends; means coupled with the top for securing the



same to the flange of the jar; and means for sealing the junction between said flat lower surface of the lid and the flange when the lid covers the jar.

4,188,266

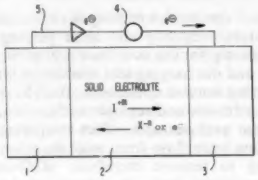
METHOD AND APPARATUS FOR CHANGING THE CONCENTRATION OF MOLECULES OR ATOMS

Richard A. Forman, 5007 Butternut Dr., Rockville, Md. 20853

Filed Apr. 11, 1978, Ser. No. 895,404

Int. Cl.[2] C25C *5/04, 1/22*

U.S. Cl. 204—1 R **12 Claims**



1. A method for changing the concentration of a preselected atom or molecule in a mixture containing said atom or molecule and at least one other atom or molecule having mass different from said preselected atom or molecule which comprises:

(A) providing a first electrode containing said mixture;

(B) providing a solid electrolyte which preferentially conducts the preselected atom or molecule in ionic form at a rate different from that of the other molecules in ionic form in said mixture;

(C) providing a second electrode of material having an electronegativity different from that of said preselected atom or molecule;

(D) placing said first and second electrodes on opposite sides of said solid electrolyte in electrically conducting relationship therewith;

(E) connecting said first and second electrodes with an electrical path to provide for the assembly of electrodes and solid electrolyte to pass current whereby said preselected atom or molecule moves in ionic form through said solid electrolyte in ionic form and concentrate at said second electrode;

(F) terminating said current when the concentration of said preselected atom or molecule at said first or second electrode has reached a predetermined level different from its concentration in said mixture; and

(G) removing from the region of said first or second electrode or said electrolyte, material having said preselected level of concentrate of said preselected molecule or atom.

12. Apparatus for changing the concentration of a preselected atom or molecule in a mixture containing said atom or

molecule and atom(s) or molecule(s) having mass d different from said preselected atom or molecule comprising:

(A) a first electrode of material containing said mixture in an amount greater than that used in a solid electrolyte battery and sufficient to permit changing the concentration of said preselected atom or molecule;

(B) a second electrode of a material having an electronegativity different from that of the preselected atom or molecule;

(C) a solid electrolyte which preferentially conducts the preselected atom or molecule in ionic form at a rate different from that of the other atoms or molecules in ionic form in said mixture and sufficiently large to provide for the preselected level of concentration of said preselected atom or molecule;

(D) said solid electrolyte being in electrical contact with and between said first and second electrodes; and

(E) an electrical path interconnecting said first and second electrodes.

4,188,267

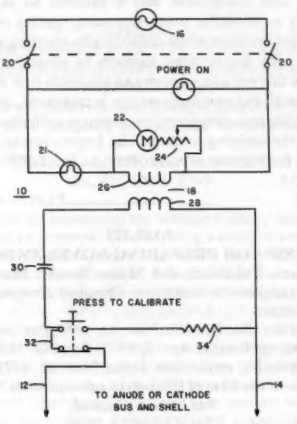
METHOD AND APPARATUS FOR MEASURING THE INTEGRITY OF AN ELECTROLYTIC CELL LINING

Edward J. Seger, Apollo, and Warren E. Haupin, New Kensington, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 797,748, May 17, 1977, abandoned. This application Jun. 8, 1978, Ser. No. 913,604

Int. Cl.[2] G01N *27/46*

U.S. Cl. 204—1 T **2 Claims**



1. A method for continuously electrically monitoring the integrity of a lining in an electrolytic cell having an outer metal shell and a lining within said shell containing a corrosive environment, said cell being supplied with DC current by lead members extending through said shell from buses located externally of the cell, the method comprising the steps of connecting the primary winding of a filament type transformer to a source of house voltage, connecting the secondary of the transformer between at least one of said buses and the shell, such that an AC voltage of a house frequency is applied between the bus and shell, and continuously monitoring the existence of any AC leakage current flowing between the bus and shell through the use of an AC voltmeter connected across the primary winding of the transformer and having a scale providing readings in electrical resistance, said leakage current being indicative of the electrical resistance condition existing between the one bus and the shell.

4,188,268

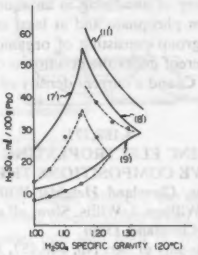
PROCESS FOR AN ELECTRODE FOR A LEAD BATTERY

Yujiro Sugahara, Tokyo; Yoshibumi Noshi, Tsuruoka; Hiroyuki Naito, Tsuruoka; Akira Takahashi, Tsuruoka; Masanori Ito, Amarume, and Hisashi Tuchida, Tsuruoka, all of Japan, assignors to Mizusawa Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 26, 1978, Ser. No. 919,047

Int. Cl.[2] H01M *10/44*

U.S. Cl. 204—2.1 **10 Claims**



1. A process for the preparation of an electrode for lead batteries comprising packing a paste of lead monoxide and sulfuric acid into a grid and subjecting the paste to the formation treatment to convert the paste to an active material and form a plate, said lead monoxide being a lead monoxide having a true density of 8.3 to 9.2 g/cc, an average particle size not larger than 0.2μ, an infrared absorption peak at a wave number of 1400 to 1410 cm^{-1} and a chromic anhydride reactivity of at least 94% or a heat treatment product thereof.

4,188,269

METHOD OF MAKING ELECTRODES FOR ELECTROLYTIC PURPOSES

Heinz P. Fritz, Munich, Fed. Rep. of Germany, assignor to Rheinisch-Westfälisches Elektrizitätswerk AG, Essen, Fed. Rep. of Germany

Filed May 22, 1978, Ser. No. 908,583

Claims priority, application Fed. Rep. of Germany, May 20, 1977, 2722840

Int. Cl.[2] C25D *5/42, 9/06*

U.S. Cl. 204—32 R **5 Claims**

1. A process for making an electrode containing lead dioxide as an active material, comprising the steps of:

(a) pickling a titanium support body;

(b) adsorptively coating the pickled titanium support body with a titanium (IV) layer by treating said body in a solution of a titanium (IV) compound selected from the group which consists of salts of inorganic oxyacids, organic salts and salts with complex formers or mixtures thereof;

(c) controlling the formation of the titanium (IV) layer on the surface of said body to preclude hydrolysis thereof by one of the steps of:

(C_1) maintaining the surface of said body in contact with a titanium (IV) perchlorate acid bath and then carrying out step (d) without rinsing of the surface,

(C_2) maintaining the surface of said body in contact with a titanium (IV) acetate acid bath and then carrying out step (d) after rinsing of the surface, and

(C_3) maintaining the surface of said body in contact with a bath of a titanium (IV) salt of cyclohexanediamine-(1,2)-tetracetic acid and then carrying out step (d) after rinsing the surface; and

(d) anodically coating the latter surface with lead dioxide.

4,188,270
PROCESS FOR ELECTROLYTICALLY FORMING GLOSSY FILM ON ARTICLES OF ALUMINUM OR ALLOY THEREOF

Akiyoshi Kataoka, Kabushiki Kaisha Shokosha nai, 8-16, Higashi 1-chome, Hanaten, Tsurumi-ku, Osaka, Japan

Filed Sep. 8, 1978, Ser. No. 940,730
Int. Cl.[2] C25D *11/08, 11/10, 11/20*
U.S. Cl. 204—42 9 Claims

1. A process for electrolytically treating an article of aluminum or alloy thereof to form a glassy film thereon, the process comprising the step of anodizing in an aqueous alkaline bath containing sodium phosphate and at least one compound selected from the group consisting of organic acids, inorganic acids and salts thereof under the conditions of a bath temperature of 20° to 90° C. and a current density of 0.5 to 80 A/dm^2.

4,188,271
ALKALINE ZINC ELECTROPLATING BATHS AND ADDITIVE COMPOSITIONS THEREFOR

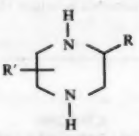
William E. Eckles, Cleveland Heights; Wilfred J. Ferguson, Cleveland, and William J. Willis, Stow, all of Ohio, assignors to Rohco, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 640,457, Dec. 15, 1975, abandoned. This application Jan. 23, 1976, Ser. No. 651,978
Int. Cl.[2] C25D *3/22, 3/24;* C08G *12/26*
U.S. Cl. 204—55 R 15 Claims

1. A composition comprising the reaction product obtained by the process of

(a) preparing an intermediate product by reacting formaldahyde with a mixture of

i. one or more piperazines having the formula



wherein R and R′ are each independently hydrogen or lower alkyl groups, and

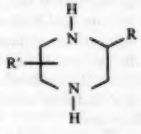
ii. at least one additional nitrogen-containing compound from the group consisting of ammonia or aliphatic, acyclic compounds containing at least one primary amine group, and

(b) reacting said intermediate product with an epihalohydrin or glycerol halohydrin or mixtures thereof at a temperature within the range of from room temperature to the reflux temperature of the mixture, the molar ratio of the piperazine(s), additional nitrogen-containing compound, formaldehyde and epihalohydrin or glycerol halohydrin being with the range of from about 1:1:2:1 to about 1:1:4.5:1.

9. An aqueous alkaline electroplating bath suitable for producing bright metallic zinc deposits comprising a source of zinc ions and an effective amount, sufficient to yield a bright zinc deposit, of a bath-soluble reaction product obtained by the process of

(a) preparing an intermediate product by reacting formaldehyde with a mixture of

i. one or more piperazines having the formula



wherein R and R′ are each independently hydrogen or lower alkyl groups and

ii. at least one additional nitrogen-containing compound from the group consisting of ammonia or aliphatic, compounds containing at least one primary amine group, and

(b) reacting said intermediate product with an epihalohydrin or glycerol halohydrin or mixtures thereof at a temperature within the range of from room temperature to the reflux temperature of the mixture, the molar ratio of the piperazine(s), additional nitrogen-containing compound, formaldehyde and epihalohydrin or glycerol halohydrin being with the range of from about 1:1:2:1 to about 1:1:4.5:1.

4,188,272
ELECTRICAL CHEMICAL PROCESS FOR THE REMOVAL OF HEXAVALENT CHROMIUM FROM AQUEOUS MEDIUM

James M. Moring, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 7, 1979, Ser. No. 36,939
Int. Cl.[2] C02C *5/12;* C25C *1/10*
U.S. Cl. 204—149 4 Claims

1. In a method for electrochemically removing from an ionizing medium a contaminant ion which is capable of forming an insoluble iron compound or complex, which comprises passing an electric current through the ionizing medium containing the ion to be removed between an anode which has a surface or a portion of a surface thereof of iron, iron alloy or insoluble iron compound, and a cathode so as to produce anodically an insoluble iron compound, species or complex in said ionizing medium while cathodically reacting said contaminant ion with the ionizing medium to generate an insoluble hydroxide thereof and whereby an insoluble iron compound or complex with the contaminant ion is produced, and removing said insoluble iron compound or complex with the contaminant ion from the ionizing medium, the improvement wherein the pH of the feed stream is controlled at a level of from about 4.5 to about 5.8.

4,188,273
PROCESS FOR PREPARING NOVEL THIN FILMS

Takezo Sano, Takatsuki, and Masao Sasaki, Ibaragi, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 526,253, Nov. 22, 1974, Pat. No. 4,056,456. This application Apr. 8, 1977, Ser. No. 785,950
Claims priority, application Japan, Nov. 22, 1973, 48-131989
The portion of the term of this patent subsequent to Nov. 1, 1994, has been disclaimed.
Int. Cl.[2] B01J *1/10*
U.S. Cl. 204—158 HE 9 Claims

1. A process for preparing a novel thin film which comprises crosslinking the surface of a layer of a surfactant selected from the group consisting of fatty acid salts, sulfuric acid esters of higher alcohols, alkylbenzenesulfonates, alkylnaphthalenesulfonates, naphthalenesulfonic acid-formalin condensates, dialkyl sulfosuccinates, alkyl phosphates, polyoxyethylene sulfates, alkylamine salts, quaternary ammonium salts, polyoxyethylene alkylamines, polyoxyethylene alkyl ethers, polyoxyethylene alkylphenol ethers, sorbitan fatty acid esters, polyoxyethylene fatty acid esters, hydroxyethylene sorbitan fatty acid esters, hydroxyethylenehydroxypropylene block polymers, fatty acid monoglycerides, and alkyl betaines, by irradiation with radiation selected from the group consisting of electron beams, X-rays, γ-rays, α-rays, neutron beams and ion beams, and then washing away the uncrosslinked portion of said surfactant with water or the like solvent to obtain an extremely thin film.

4,188,274

PROCESS FOR TRIFLUOROMETHYLATION OF AROMATIC AND HETEROCYCLIC COMPOUNDS

Ellis K. Fields, River Forest, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 553,093, Feb. 26, 1975. This application May 19, 1978, Ser. No. 907,822

Int. Cl.[2] B01J *1/10*

U.S. Cl. 204—158 HA 5 Claims

1. A decarboxylation process for introducing a trifluoromethyl group into aromatic compounds which comprises reacting the silver salt of trifluoroacetic acid and a ring compound containing a group selected from the class consisting of aromatic groups, heterocyclic groups, and mixtures thereof under decarboxylation conditions at −25° to 300° C.

4,188,275

PROCESS FOR PREPARING BETA-PHOSPHOSULFOXY ALCOHOLS

Ellis K. Fields, River Forest, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 836,398, Sep. 26, 1977, Pat. No. 4,155,958. This application Dec. 4, 1978, Ser. No. 965,795

Int. Cl.[2] B01J *1/10*

U.S. Cl. 204—158 R 4 Claims

1. A process for preparing beta-phosphosulfoxy alcohols by reacting an olefinically unsaturated compound containing 2 to 30 carbon atoms and a poly-thiophosphoric acid containing 2 to 48 carbon atoms with oxygen using actinic radiation as an energy source at a temperature within the range from about −10° to +70° C.

4,188,276

VOLTAGE STABLE POSITIVE TEMPERATURE COEFFICIENT OF RESISTANCE CROSSLINKED COMPOSITIONS

Bernard J. Lyons, Atherton, and Young J. Kim, East Palo Alto, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Aug. 4, 1975, Ser. No. 601,550

Int. Cl.[2] C08F *8/00*

U.S. Cl. 204—159.17 33 Claims

1. A method for improving the voltage stability of an electrically conductive composition exhibiting a positive temperature coefficient of resistance, said composition comprising a crosslinked mixture of conductive carbon black and a polymer selected from homopolymers and copolymers comprising the repeat unit $—CH_2—CF_2—$, said method comprising:

(1) mixing said polymer with an amount of conductive carbon black sufficient to impart a positive temperature coefficient of resistance to the composition and render it electrically conductive, and at least one polymerizable polyfunctional unsaturated monomer in an amount sufficient to increase the voltage stability of said composition when said composition is crosslinked and

(2) crosslinking said composition.

4,188,277

PROCESS FOR DESALTING PETROLEUM OILS

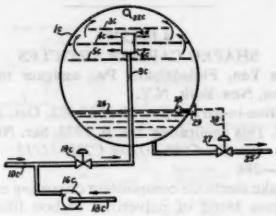
Robert B. Martin, Spring, Tex., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 867,417, Jan. 6, 1978, which is a continuation-in-part of Ser. No. 784,392, Apr. 4, 1977, Pat. No. 4,149,958. This application Nov. 14, 1978, Ser. No. 960,801

Int. Cl.[2] B01D *17/06;* C10G *33/02*

U.S. Cl. 204—190 10 Claims

1. A process for desalting a petroleum oil comprising emulsifying said oil with water to form a first stage emulsion, passing said emulsion between horizontally disposed electrodes contained in a treating vessel, whereby said emulsion is subjected to an electric field and the emulsion is broken, allowing de-emulsified water to fall towards the bottom of the vessel, collecting the so-treated first stage product, maintaining a pool of water in the lower portion of said vessel, emulsifying the first stage product with fresh water to form a second stage emulsion, passing said second stage emulsion between horizontally disposed electrodes in a path substantially parallel to but above that followed by the first stage emulsion and hydraulically substantially isolated therefrom but with no impermeable



barriers between the stages, whereby the second stage emulsion is broken, allowing de-emulsified water to fall towards the bottom of the vessel into said pool of water, allowing the treated second stage product to rise between the edges of the upper electrode and the wall of the vessel, and withdrawing desalted product from the upper portion of said vessel and water from the lower portion of said vessel.

4,188,278

APPARATUS FOR DEGERMINATING FLUIDS

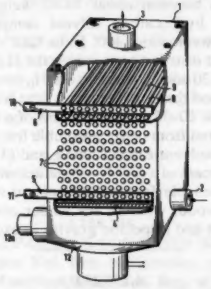
A. Reis, Munich; N. Kirmaier, Aschheim, and M. Schöberl, Prien, all of Fed. Rep. of Germany, assignors to Institut für Biomedizinische Technik, Munich, Fed. Rep. of Germany

Filed Jan. 23, 1978, Ser. No. 871,604

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1977, 2742508

Int. Cl.[2] C02B *1/82;* C02C *5/12*

U.S. Cl. 204—268 9 Claims



1. An apparatus for treating fluids by anodic oxidation comprising

an electrolytic cell, having an inlet and an outlet through which said fluid flows,

a pair of main electrodes opposed to each other in the electrolytic cell,

a voltage source connected to the main electrodes,

a plurality of auxiliary electrodes disposed between the main electrodes,

each main electrode comprising a plurality of electrically connected bars which are arranged in a plane and parallel to each other,

each auxiliary electrode comprising electrically insulated bars which are arranged in a plane and parallel to each

other but whose bars are transversely shifted with respect to the bars of the adjacent electrode,

the main electrodes providing a region of varying potential between them through which the fluid flows,

the main electrodes located at the inlet and the outlet of the cell are substantially transverse to and cover the entire cross-section of fluid flow and are provided with openings between their bars to allow the passage of the fluid.

4,188,279

SHAPED CARBON ARTICLES

Tsoung-Yuan Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 735,302, Oct. 26, 1976, abandoned. This application Jan. 6, 1978, Ser. No. 867,557

Int. Cl.[2] **C08L** *95/00;* **C25B** *11/12*

U.S. Cl. 204—294 **13 Claims**

1. A pre-bake electrode composition consisting essentially of a homogeneous blend of pulverized carbon filler, between about 15 and 35 percent by weight of electrode binder pitch, and between about 0.1 and 10 percent by weight of an additive selected from phosphorus and boron oxides and acids; wherein said electrode binder pitch consists essentially of a homogeneous blend of (1) between about 30–45 weight percent of a highly aromatic hydrocarbon solvent component having a boiling point between about 450° F. to 1200° F. and having a hydrogen content distribution in which the H_{Ar} proton content is between about 30 and 50 percent, the H_α proton content is at least 30 percent and the H_α/H_β proton ratio is above about 1.4; (2) between about 20–35 weight percent of a highly aromatic component selected from benzene-soluble fractions of solvent-refined coal and solvent-refined wood; and (3) between about 20–40 weight percent of a highly aromatic component selected from benzene-insoluble fractions of solvent-refined coal and solvent-refined wood, wherein the binder composition has a 230° F. soft point and a specific gravity in excess of 1.2.

4. A carbon electrode consisting essentially of a baked homogeneous blend of a particulate coke matrix, between about 15 and 35 percent by weight of electrode binder pitch, and between about 0.1 and 10 percent by weight of an additive selected from phosphorus and boron oxides and acids; wherein said electrode binder pitch consists essentially of a homogeneous blend of (1) between about 30–45 weight percent of a highly aromatic hydrocarbon solvent component having a boiling point between about 450° F. to 1200° F. and having a hydrogen content distribution in which the H_{Ar} proton content is between about 30 and 50 percent, the H_α proton content is at least 30 percent and the H_α/H_β proton ratio is above about 1.4; (2) between about 20–35 weight percent of a highly aromatic component selected from benzene-soluble fractions of solvent-refined coal and solvent-refined wood; and (3) between about 20–40 weight percent of a highly aromatic component selected from benzene-insoluble fractions of solvent-refined coal and solvent-refined wood, wherein the binder composition has a 230° F. soft point and a specific gravity in excess of 1.2.

4,188,280

METHOD FOR REMOVING ARSENIC FROM SHALE OIL

Harbo P. Jensen, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 25, 1978, Ser. No. 945,750

Int. Cl.[2] **C10G** *23/00, 37/06*

U.S. Cl. 208—53 **8 Claims**

1. A method for producing a hydroprocessed shale oil product from a shale oil feedstock contaminated with more than 4 ppmw arsenic in the form of at least one soluble arsenic compound, which comprises:

(a) forming an aged shale oil having an arsenic content lower than that of said feedstock by contacting said feedstock with a porous solid contact material at a temperature from 149° to 510° C. (300° to 950° F.), at a liquid hourly space velocity from 0.1 to 60 volumes of liquid per hour per volume of contact material, and a pressure sufficient to maintain said feedstock in substantially liquid phase, whereby a portion of said arsenic is deposited upon said contact material;

(b) forming a coker distillate having an arsenic content lower than that of said aged shale oil and an arsenic-containing coke by coking at least a portion of said aged shale oil; and

(c) forming said shale oil product having less than 1 ppmw soluble arsenic and a higher hydrogen-to-carbon ratio than said feedstock by catalytically reacting at least a portion of said distillate from step (b) at an elevated temperature with hydrogen in the presence of a hydroprocessing catalyst.

4,188,281

TWO-STAGE PRODUCTION OF OLEFINS UTILIZING A FAUJASITE STRUCTURE ZEOLITE IN HYDROGENATION STAGE

Hans J. Wernicke, Wolfratshausen; Allan Watson, Ottobrunn; Walter Kreuter, Penzberg; Manfred Mansmann, and Horst Weber, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden and Bayer Aktiengesellschaft, Leverkusen, both of, Fed. Rep. of Germany

Filed May 12, 1978, Ser. No. 905,486

Claims priority, application Fed. Rep. of Germany, May 12, 1977, 2721503; Apr. 12, 1978, 2815859

Int. Cl.[2] **C10G** *23/02, 9/46*

U.S. Cl. 208—57 **22 Claims**

1. In a process for the production of olefins in two stages wherein, in the first stage, a heavy petroleum fraction is hydrogenated essentially in the liquid phase in the presence of hydrogen and a hydrogenation catalyst and, in the second stage, the thus-hydrogenated fraction is subjected to thermal cracking in the vapor phase in the presence of steam, the improvement which comprises employing as the hydrogenation catalyst a zeolite of the faujasite structure combined with elements from Groups VIB, VIIB and VIII of the periodic table of the elements, wherein the alkali component of the zeolite is exchanged at least partially for ammonium, hydronium, alkaline earth and/or rare earth ions, and the elements are present in a metallic, ionic, oxidic and/or sulfidic form.

4,188,282

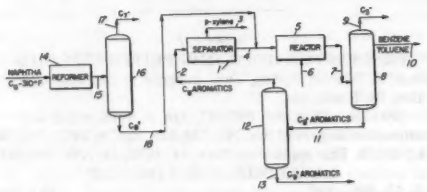
MANUFACTURE OF BENZENE, TOLUENE AND XYLENE

Samuel A. Tabak, Wenonah, and Roger A. Morrison, West Deptford, both of N.J., assignors to Mobile Oil Corporation, New York, N.Y.

Filed Jun. 12, 1978, Ser. No. 914,645

Int. Cl.[2] **C10G** *35/04;* **C07C** *5/24*

U.S. Cl. 208—134 **34 Claims**



1. A new use of known apparatus for simultaneously isomerizing xylenes and converting ethylbenzene to products readily separable by distillation from the mixture of C_8 aromatics by contacting a mixture of C_8 aromatics and hydrogen with a catalyst at conversion conditions of elevated temperature and pressure in a loop comprising an isomerization reactor for the

contact aforesaid, distillation means for separating C_8 aromatics from lower boiling and higher boiling hydrocarbons, means to transfer hydrocarbon effluent of said isomerization reactor to said distillation means, mixing means for mixing fresh feed C_8 aromatics containing xylenes and ethylbenzene with C_8 aromatics separated by distillation means, a xylene separator for recovery of para xylene, means for transfer of mixed C_8 aromatics from said mixing means to said xylene separator, and means to transfer C_8 aromatics lean in para xylene from said xylene separator to said isomerization reactor, which new use comprises contacting, in the isomerization reactor of said known apparatus, a vapor phase mixture of hydrogen, said C_8 aromatics lean in para xylene and fresh charge material containing alkyl benzenes of more than eight carbon atoms with a zeolite catalyst at a temperature of about 800°–1000° F., a pressure of 150 to 300 pounds per square inch and a weight hourly space velocity between 1 and about 200; said zeolite catalyst having a constraint index of 1 to 12, a silica to alumina ratio greater than 12 and a reduced activity such that less than 2 weight percent of xylene is converted to other compounds when contacted with said catalyst at 900° F., 200 psig and LHSV of 5.

4,188,283
STARTUP METHOD FOR A MOVING-BED HYDROGENATION ZONE

George J. Czajkowski, Chicago, and Frank Stolfa, Park Ridge, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 761,504, Jan. 21, 1977, Pat. No. 4,119,530, which is a continuation-in-part of Ser. No. 610,479, Sep. 4, 1975, abandoned. This application Jun. 8, 1978, Ser. No. 913,710

Int. Cl.[2] C10G *23/08*

U.S. Cl. 208—143 **2 Claims**

1. A startup method for a hydrogenation process in which a feed stream comprising hydrogen and olefinic materials is contacted with a bed of solid catalyst located in a substantially cylindrical catalyst retention volume which comprises the steps of:

(a) passing the feed stream downward through a moving-bed reactor while less than 99 vol.% of the catalyst retention volume of the moving-bed reactor is filled by the bed of solid catalyst and effecting the hydrogenation of olefinic materials in the feed stream at on-stream non-cracking hydrogenation conditions including a pressure of from about 100 psig. to about 1200 psig. and a temperature of from about 250° F. to about 500° F. and a hydrogen feed rate of about 500 scf/bbl to 2000 scf/bbl;

(b) intermittently charging a quantity of catalyst greater than 0.1 vol.% of the catalyst retention volume and less than 5.0 vol.% of the catalyst retention volume per intermittent charge of catalyst to the reactor at a first rate of catalyst transfer and distributing each quantity of catalyst on top of the bed of solid catalyst;

(c) intermittently removing a quantity of used catalyst from the bottom of the reactor at a second rate of catalyst transfer less than the first rate of catalyst transfer; and,

(d) equalizing the first and the second rates of catalyst transfer when the catalyst retention volume of the moving-bed reactor becomes filled.

4,188,284
PROCESS FOR THE HYDROTREATING OF HEAVY HYDROCARBON STREAMS

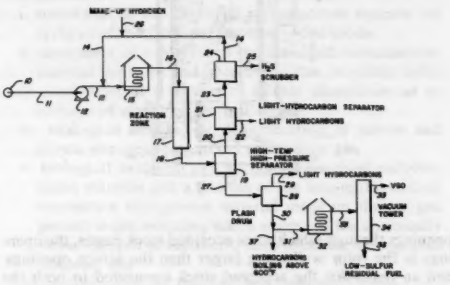
Leonard M. Quick, Naperville, Ill., and Albert L. Hensley, Jr., Munster, Ind., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 862,848, Dec. 21, 1977, abandoned. This application Dec. 7, 1978, Ser. No. 967,432

Int. Cl.[2] C10G *23/02*

U.S. Cl. 208—216 PP **27 Claims**

1. A process for hydrotreating a heavy hydrocarbon stream containing metals, asphaltenes, nitrogen compounds, and sulfur compounds to reduce the contents of metals, asphaltenes, nitrogen compounds, and sulfur compounds in said stream, which process comprises contacting said stream under suitable conditions and in the presence of hydrogen with a catalyst comprising a hydrogenating component consisting essentially of (1) molybdenum and chromium, (2) their oxides, (3) their sulfides, or (4) mixtures thereof on a large-pore, catalytically active alumina, said molybdenum being present within the range of about 5 wt.% to about 15 wt.%, calculated as MoO_3



and based upon the total catalyst weight, said chromium being present in an amount within the range of about 5 wt.% to about 20 wt.%, calculated as Cr_2O_3 and based upon the total catalyst weight, and said catalyst having a pore volume within the range of about 0.4 cc/gm to about 0.8 cc/gm, a surface area within the range of about 150 m^2/gm to about 300 m^2/gm, and an average pore diameter within the range of abbout 100 A to about 200 A.

4,188,285
SELECTIVE PROCESS FOR REMOVAL OF THIOPHENES FROM GASOLINE USING A SILVER-EXCHANGED FAUJASITE-TYPE ZEOLITE

Manfred J. Michlmayr, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 20, 1978, Ser. No. 971,576

Int. Cl.[2] C10G *25/04*

U.S. Cl. 208—246 **7 Claims**

1. A process for upgrading a hydrofined gasoline feed containing residual thiophene-type contaminants comprising contacting said feed with a silver-exchanged faujasite-type crystalline aluminosilicate zeolite, said contacting being at (1) a temperature in the range of from about 20° to 370° C., and (2) an LHSV, V/V/Hr, in the range of from about 0.1 to 20; and recovering the resulting gasoline having, relative to said feed, a substantially reduced content of said contaminants.

4,188,286
SCREENING APPARATUS FOR FIBER SUSPENSIONS

Emil Holz, Eningen, Fed. Rep. of Germany, assignor to Hermann Finckh Maschinenfabrik, Fed. Rep. of Germany

Filed Mar. 16, 1978, Ser. No. 887,123

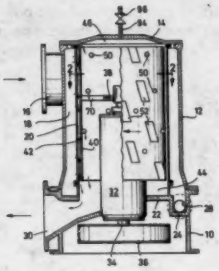
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1977, 2712715

Int. Cl.[2] B07B *1/20*

U.S. Cl. 209—273 **9 Claims**

1. A screening apparatus for fiber suspensions comprising a housing and a stationary cylindrical screen cage having one side in flow communication with an inlet for said fiber suspensions and further having screen openings through which fiber suspension from the inlet flows as accepted stock; a rotor having a hollow cylindrical, substantially closed circumferential wall concentrically mounted relative to the screen cage over substantially the length thereof with one side adjacent the side of the screen cage not in direct flow communication with the inlet to form an annular space between the screen cage and the circumferential wall of the rotor for accepted stock, the

circumferential wall of the rotor further having elevations extending into the annular space immediately radially adjacent the screen openings for producing positive and negative pressure thrusts in the accepted stock within the annular space, and



openings through which some accepted stock passes, the openings in the rotor wall being larger than the screen openings; and an outlet for the accepted stock connected to both the annular space and the opposite side of the rotor.

4,188,287

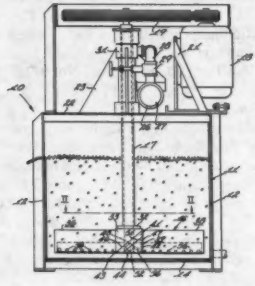
SLOW SPEED WEDGE BAR FLOTATION MIXING DEVICE

Bobby P. Faulkner, and Donald C. Moore, both of New Berlin, Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 849,674, Nov. 8, 1977, abandoned. This application Nov. 13, 1978, Ser. No. 960,223

Int. Cl.[2] B03D *1/20*

U.S. Cl. 209—168 **3 Claims**



1. A distributor for a flotation apparatus comprising:

a vertical hollow drive shaft adapted to receive air under pressure;

a manifold secured to the depending end of said hollow drive shaft for rotation with said drive shaft, said manifold being connected to receive air under pressure from said shaft;

a plurality of distribution ports formed in said manifold to provide communicating passageways from the interior of said manifold to the exterior thereof;

a plurality of horizontally extending blades secured to said manifold;

a longitudinal passageway in each of said blades, the end of the passageways adjacent to said manifold being in communication with an associated manifold distribution port; and,

a plurality of individual means along the trailing edge of each of said blades and communicating with the associated longitudinal passage to provide for the discharge of the air under pressure in the passageway to cause a discrete bubble size to be emitted therefrom with low power input, said means being operable to regulate the discharge of air under pressure to provide for the discharge of air under pressure to cause a discrete bubble size to be emitted therefrom so that the bubbles emitted along the entire length of each blade are substantially the same size.

4,188,288

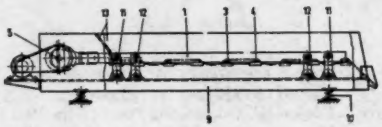
SCREEN WITH TUBULAR FRAME SYSTEMS COUPLED FOR RECTILINEAR MOTION

Albert Wehner, deceased, late of Wieladingen, Fed. Rep. of Germany (by Elfriede Wehner, legal representative), assignor to Hein, Lehmann AG, Dusseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 650,113, Jan. 19, 1976, which is a continuation of Ser. No. 501,652, Aug. 29, 1974, abandoned, which is a continuation of Ser. No. 310,806, Nov. 30, 1972, abandoned. This application Feb. 27, 1978, Ser. No. 881,265

Int. Cl.[2] B07B *1/42*

U.S. Cl. 209—310 **3 Claims**



1. A screening mechanism of the type having a base frame, two frame systems, each of which include two spaced-apart, longitudinally-extending, beams and a plurality of transversely-extending, spaced-apart rods, the ends of which are coupled to said beams, said frame systems being disposed relative to one another such that each of the rods of one frame system are disposed between the rods of the other frame system, said frame systems including an elastic sieve bottom secured alternately to the rods of the one frame system and the rods of the other frame system and bridging the spaces between said rods, means for movably mounting one of said frame systems on said base frame and means for movably mounting said other frame system on said base frame and drive means for moving said frame systems in a longitudinal direction thereof relative to one another, the improvement comprising:

said frame systems each forming a ladder-shaped frame system which comprises two tubular beams and a plurality of tubular rods, the ends of the latter of which are fixably secured to said beams, and said frame systems being mounted at an angle of inclination on said base frame;

spaced supports for each said beam and connecting means coupling said drive means to each of said frame systems;

said means for movably mounting said frame systems effecting exclusively rectilinear movement of said frame systems so that said drive means moves said frame systems in countermoving rectilinear oscillations; and

a pair of vertically disposed, longitudinally-extending sheet metal guide sheets carried by one of said frame systems, said guide sheets being disposed on opposite lateral sides of said one frame system.

4,188,289

PROCESS FOR PURIFICATION OF SANITARY WATERS

Ferdinand Besik, 3243 Chokecherry Crs., Mississauga, Ontario, Canada (L5L 1B1)

Filed Jul. 18, 1978, Ser. No. 918,051

Int. Cl.[2] C02C *1/08, 1/40*

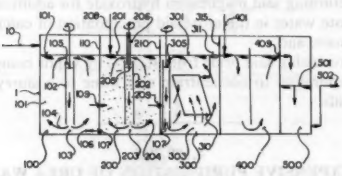
U.S. Cl. 210—7 **4 Claims**

1. A process for the purification of waste waters containing carbonaceous materials, nitrogenous materials, phosphorus and suspended solids in a single reaction tank which comprises:

(a) separating the reaction tank by vertical partitions into first reaction zone, second reaction zone and third reac-

tion zone, the first reaction zone being in communication with the second reaction zone by a restricted opening in the common partition separating the first reaction zone from the second reaction zone, the second reaction zone being in communication with third reaction zone by restricted opening in the common partition separating the second reaction zone from the third reaction zone, the third reaction zone being in communication with the first reaction zone by a channel and restricted opening in the common partition separating the third reaction zone from the first reaction zone, said third reaction zone being in communication with an exit effluent line via submerged multichannel suspended solids separator located in third reaction zone, said submerged multichannel suspended solids separator equipped with means equalizing the flow of the purified waste water through the submerged suspended solids separator, said purified waste water flowing out of said third reaction zone being further treated or disposed off,

(b) establishing in first reaction zone, second reaction zone and third reaction zone fluidized beds, said fluidized bed in said first reaction zone, second reaction zone and third reaction zone being formed by addition of fine wood particles prefereably saw dust into the reaction zones before or during start up of the purification process and by accumulating the nonbiodegradable suspended solids present in the waste water, and by accumulating the precipitates formed in precipitating the phosphates from the processed waste water, and by accumulating the excess biological solids formed during biological oxidation of the organic matter present in the processed waste water, said



fluidized bed in each reaction zone being maintained by flow path of the suspension downwardly from the upper level of the fluidized bed in a recirculation pipe to the lower level of the fluidized bed, then upwardly through the fluidized bed, said recirculation of the suspension in first reaction zone and third reaction zone being maintained by a submerged propeller located in the recirculation pipe without adding atmospheric air into the recirculated suspension and maintaining the concentration of the disolved oxygen in said first and third reaction zones at close to zero mg/lit, said recirculation of the suspension in the second reaction zone being maintained by a submerged propeller located in the recirculation pipe and equipped with an air intake pipe simultaneously injecting into the recirculated suspension atmospheric air to provide partial saturation of the recirculating suspension with oxygen and maintaining the concentration of the disolved oxygen in the second reaction zone between 1.0 and 3.0 mg/lit.,

(c) adding into the fluidized bed established in the second reaction zone continuously soluble mineral to precipitate the various phosphates present in the incoming waste water, to coagulate and flocculate the colloidal matter present in the incoming waste water and to flocculate the fine suspended solids retained in said fluidized bed established in said first, second and third reaction zones,

(d) circulating a portion of the fluidized bed suspended solids from the first reaction zone into the second reaction zone, from said second reaction zone into third reaction zone and from said third reaction zone into said first reaction zone,

(e) flowing the incoming waste water into the fluidized bed established in said first reaction zone and mixing said waste water in said fluidized bed with the fluidized fine wood particles, nonbiodegradable suspended solids, mixed microbial population and recycled purified waste water,

(f) controlling the retention time of said mixture of waste water and fluidized bed suspended solids in said first reaction zone to carry out during said retention time in said fluidized bed in said first reaction zone simultaneously the processes of:

i. adsorbtion of the dissolved carbonaceous material on surfaces of the fluidized bed suspended solids

ii. absorption of a portion of the dissolved carbonaceous material ammonia and phosphorus into microbial cells,

iii. adsorption of a portion of soluble phosphates on to surfaces of said fluidized bed solids,

iv. biological respiratory denitrification of nitrite and nitrate nitrogenous material to nitrogen gas,

v. biological oxidation of a portion of dissolved carbonaceous material and a portion of the non-nitrite and/or non-nitrate nitrogenous material using up the oxygen present in the incoming waste water and the chemically bound oxygen in said nitrite and/or nitrate nitrogenous material, and

vi. hydrolysis of the fluidized bed suspended solids,

(g) allowing the formed carbon dioxide and nitrogenous gases to rise through the fluidized bed in said first reaction zone cocurrently to said suspension flow and separating the gases from said suspension at the upper level of the fluidized bed and releasing said gases to atmosphere,

(h) flowing the mixture of partially purified waste water and the fluidized bed solids by gravity from said first reaction zone into said second reaction zone, mixing said mixture in said fluidized bed established in said second reaction zone with fluidized bed solids and with the diffused air injected into the recirculated suspension by said submerged propeller and carrying out in the second reaction zone simultaneously the processes of:

i. biooxidation of the remaining disolved carbonaceous material present in the partially purified waste water,

ii. transformation of remaining non-nitrite and/or non-nitrate nitrogenous material to nitrite and/or nitrate nitrogenous material,

iii. partial respiratory degradation of the nitrite and/or nitrate nitrogenous material to nitrogenous gas,

iv. chemical precipitation of phosphates and free metal ions from the partially purified waste water by the added dissolved mineral,

v. adsorption of a portion of soluble phosphates on the surfaces of the fluidized bed solids,

vi. partial biooxidation of the carbonaceous material adsorbed on the fluidized bed solids,

vii. hydrolysis of a portion of fluidized bed solids,

viii. coagulation and flocculation of the colloidal matter present in the partially purified waste water,

(i) allowing the excess diffused air and the formed carbon dioxide and nitrogenous gases to rise through the fluidized bed in said second reaction zone cocurrently to flow of said suspension and separating the gases from the suspension at the upper level of the fluidized bed and releasing the gases to atmosphere,

(j) flowing the mixture of partially purified waste water and the fluidized bed solids by gravity from said second reaction zone into said third reaction zone, mixing said mixture in said fluidized bed established in said third reaction zone with the purified waste water and with the fluidized bed solids in absence of disolved oxygen and carrying out in said third reaction zone simultaneously the processes of:

i. biooxidation of the carbonaceous material adsorbed on the surfaces of the fluidized bed solids and biooxidation of the carbonaceous material absorbed by the microbial cells,

ii. respiratory degradation of the nitrite and/or nitrate nitrogenous material to nitrogenous gas,

iii. biooxidation of the disolved material released into the purified waste water through hydrolysis of said fluidized bed solids,

iv. coagulation and flocculation of the colloidal matter present in the fluidized bed,

v. separation of the suspended solids from the purified waste water,

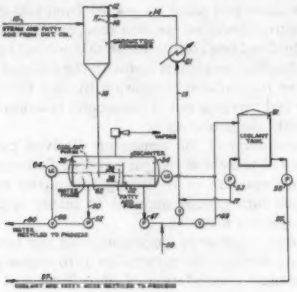
(k) allowing the formed carbon dioxide and nitrogenous gases to rise through the fluidized bed in said third reaction zone cocurrently to said suspension flow and separating the gases from the suspension at the upper level of the fluidized bed and releasing the gases to atmosphere,

(l) flowing the suspended solids separated from the purified waste water in said reaction zone together with portion of the purified waste water back into said first reaction zone completing the process cycle and flowing the purified waste water out of said third reaction zone for further treatment or disposal.

4,188,290
POLLUTION CONTROL FOR FATTY ACID CONDENSATION

James J. Graham, Wayland, Mass., and Roger J. Vernon, Maidenhead, England, assignors to The Badger Company, Cambridge, Mass.

Filed Jun. 29, 1977, Ser. No. 811,329
Int. Cl.[2] B01D *5/00, 21/00*
U.S. Cl. 210—21 **6 Claims**



1. The process of separating fatty acids from steam containing fatty acids entrained therein, comprising contacting the steam and fatty acids therein with a cooling medium comprising a fatty acid having between six and eighteen carbon atoms which is miscible with the fatty acids entrained in the steam passed directly to a barometric condenser to form a condensate of acid vapors, said cooling medium having a temperature above about 80° F., separating the resulting organic and water phases of the condensate by decantation, recycling a portion of the organic phase for use as the cooling medium, and processing the other separated liquid components for recovery of water and fatty acids.

4,188,291
TREATMENT OF INDUSTRIAL WASTE WATER

Donald R. Anderson, 3062 Blume Dr., Los Alamitos, Calif. 90720

Filed Apr. 6, 1978, Ser. No. 894,174
The portion of the term of this patent subsequent to Jul. 19, 1994, has been disclaimed.
Int. Cl.[2] C02B *1/20;* **B01D** *13/02, 21/01*
U.S. Cl. 210—23 H **10 Claims**

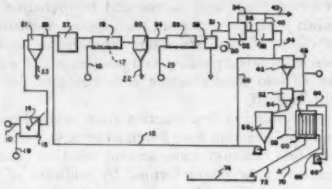
10. The method of processing waste water from an electrical power generation plant which comprises:

(a) adding calcium hydroxide to the waste water in an amount sufficient to coprecipitate magnesium hydroxide and silica in the water;

(b) adding magnesium hydroxide and gaseous carbon dioxide to the waste water in an amount sufficient to precipitate calcium carbonate in the water;

(c) settling the precipitates in said water and recovering a treated water having substantially reduced silica and calcium contents and a higher magnesium salt content than said waste water;

(d) processing the treated water by reverse osmosis, distillation, electrodialysis or freezing to obtain a purified water



and a residual brine enriched in calcium and magnesium contents;

(e) adding calcium hydroxide to at least a portion of said brine in an amount sufficient to precipitate magnesium hydroxide therefrom;

(f) separating said magnesium hydroxide from said brine;

(g) returning said magnesium hydroxide for addition to said waste water in the aforesaid precipitation of calcium carbonate; and

(h) processing said brine from step (f) by vapor compression evaporation to concentrate said brine to a slurry of salt solids.

4,188,292
INEXPENSIVE PURIFICATION OF UREA WASTE STREAMS

William O. Fitzgibbons, Hudson, Ohio, assignor to Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 463,476, Apr. 24, 1974, abandoned. This application Oct. 31, 1977, Ser. No. 847,201
Int. Cl.[2] C02B *1/16, 1/44*
U.S. Cl. 210—29 **16 Claims**

1. A process for destroying urea dissolved in an aqueous stream further containing anions and cations comprising:

(a) contacting the aqueous stream with a hydrogen form cation exchange resin in such a manner that at least some of the cations in the aqueous stream are exchanged with the cations of the resin, and

(b) contacting the resulting stream from step (a) with nitric oxide, nitrous acid or a nitrite salt, thereby substantially reducing the urea content of said aqueous stream, said resulting stream having a pH of 1–3 when contacted with said nitric oxide, nitrous acid or a nitrate salt.

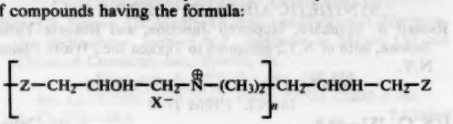
4,188,293
METHOD OF EFFECTING FLOCCULATION

Harold A. Green, Havertown, Pa.; John J. Merianos, Jersey City, and Alfonso N. Petrocci, Glen Rock, both of N.J., assignors to Kewanee Industries, Inc., Bryn Mawr, Pa.

Division of Ser. No. 902,894, May 4, 1978, which is a continuation-in-part of Ser. No. 744,617, Nov. 24, 1976, Pat. No. 4,089,977. This application Jan. 4, 1979, Ser. No. 980
Int. Cl.[2] B01D *21/01;* **C02B** *1/20*
U.S. Cl. 210—47 **1 Claim**

1. A method of effecting flocculation in aqueous systems containing solid particles in suspension which comprises applying to said aqueous systems an effective amount sufficient to

form flocs from said solid particles of a compound or mixture of compounds having the formula:



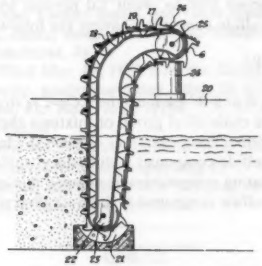
wherein Z is selected from the group consisting of X and $-N(CH_3)_2$, wherein X is a halogen having an atomic weight greater than 34, wherein X^- is the anionic form of X, there being one such anionic halogen for each cationic nitrogen, and wherein n is an integer of from 2 to 20, said compound or mixture of compounds being formed by the reaction of substantially equimolar proportions of 1, 3-bis-dimethylamino-2-propanol and 1, 3-dichloro-2-propanol, the reaction being effected at a temperature of about 40° to about 90° C. for about 2 to 12 hours.

4,188,294

ROTARY FILTER APPARATUS

Tadashi Hagihara, 655 Karakashiwa, Isawa-cho, Higashi-Yatsushiro, Yamanashi, Japan

Filed May 18, 1978, Ser. No. 906,967
Int. Cl.[2] B01D *33/02*
U.S. Cl. 210—160 **7 Claims**



1. A rotary filter apparatus for continuous removal of solids from water currents in a channel of given width and depth, comprising:

a frame with a first track and a second track installed at least partially in said water currents in the channel,

a filter medium in the form of an endless belt, said filter medium including endless connecting means for forming the endless belt, a number of transverse linking rods each with at least one track means on one end thereof, said linking rods linked to said endless connecting means and positioned parallel with each other, said track means for following said first track positioned in working relationship to said first track, said filter medium including screen means for filtering purposes incorporated longitudinally with respect to said endless connecting means, said screen means includes a plurality of parallel members positioned longitudinally with respect to said endless connecting means,

a filter plate positioned between each said parallel members and fitted rockably on one of said linking rods, said filter plate including a forward portion and a rear portion,

transverse interlocking rods including at least one interlocking rod tracking means on at least one end of each transverse interlocking rod, said interlocking rod tracking means for following said second track and positioned in working relationship to said second track and positioned to pass through said rear portion of each said filter plate, and

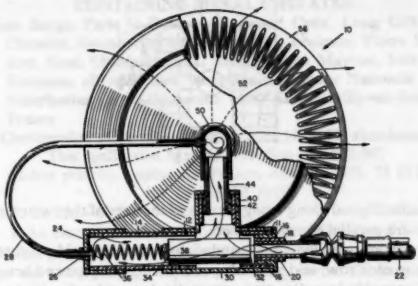
drive means for imparting rotation to said filter medium which travels with said linking rods regulated by said first track of said frame and said interlocking rods regulated by said second track of said frame.

4,188,295

APPARATUS FOR CHLORINATING AND FILTERING WATER FOR SWIMMING POOLS DURING FILLING OPERATION

Willis R. Burnett, Orlando, Fla., assignor to Mid-Florida Pools and Repair, Inc., Orlando, Fla.

Filed Aug. 15, 1977, Ser. No. 824,360
Int. Cl.[2] C02B *1/36;* **E04H** *3/20*
U.S. Cl. 210—206 **6 Claims**



1. Apparatus for chlorinating swimming pools during a filling operation comprising:

a hollow, cylindrical tube;

a first cap member over one end of said tube and having an opening therein;

a nozzle cooperating with said cap member and extending through said opening for directing a stream of water axially through said tube;

a second cap member over the other end of said tube having an opening therein;

a tube outlet extending substantially transverse to the axis of said tube for feeding chlorinated water to said swimming pool;

a generally cylindrical stick of chlorine positioned in said tube, said stick being supported by biasing means between said stick and said second cap member for biasing said stick against the flow of water from said nozzle, said stick being positioned adjacent said tube outlet so that a major portion of said flow of water contacts said stick and flows directly through said tube outlet;

a bypass tube having a smaller cross-section than said outlet and communicating between said opening in said second cap member and said tube outlet at a point distal from said inlet, said bypass tube receiving water passing along said stick and having a higher chlorine content than water passing into said outlet;

means for developing a high pressure in said bypass tube with respect to said stream from said inlet; and

wherein said stick has an outer diameter slightly smaller than the inner diameter of said tube, such that a substantial surface area of said stick is present for erosion at a relatively high water pressure with respect to the pressure at said nozzle.

4,188,296

FUEL COMBUSTION AND MAGNETIZING APPARATUS USED THEREFOR

Etuo Fujita, No. 2-15-17, Jiyugaoka, Meguro-ku, Tokyo, Japan (152)

Filed Jan. 10, 1978, Ser. No. 868,291
Claims priority, application Japan, Jan. 10, 1977, 52/774
Int. Cl.[2] B01D *35/06;* **F23D** *0/0*
U.S. Cl. 210—222 **3 Claims**

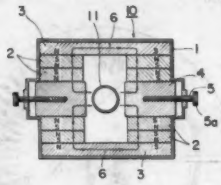
1. In combination with pipes for feeding fluid fuel and air-

containing gas to combustion devices, a magnetizing apparatus comprising

a casing having means for securing the casing on the pipe so that the pipe penetrates the casing substantially at the center thereof,

a pair of connecting yokes fixedly disposed in the casing at opposite sides thereof,

a plurality of permanent magnets placed in two parallel rows between said connecting yokes said magnets being oriented such that the poles of all of the magnets in each row



are aligned along a single axis and the axes of the two rows are parallel to one another,

a pair of movable yokes sandwiched between said magnets in each row, said movable yokes facing the pipe and being movable in a direction perpendicular to the direction of the rows of said permanent magnets and

adjusting means for moving said movable yokes towards and away from the pipe in the direction perpendicular to the direction of the rows of said permanent magnets,

wherein said magnets and yokes produce a variable flux density of at least 10 gauss traversing the pipe.

4,188,297

LUBRICANT ADDITIVE

Gerald J. J. Jayne, Wokingham, England, and David R. Woods, Kilcolgan, Ireland, assignors to Edwin Cooper and Company Limited, Bracknell, England

Filed Jul. 12, 1978, Ser. No. 923,816

Claims priority, application United Kingdom, Jul. 22, 1977, 30977/77

Int. Cl.[2] C10M *1/38;* C07G *17/00*

U.S. Cl. 252—45 **58 Claims**

1. A lubricating oil additive made by the process comprising reacting about 0.5–1.5 moles of at least one reactive olefinically unsaturated hydrocarbon containing about 6–30 carbon atoms and 1–3 olefinic double bonds with about 0.5–5 moles of elemental sulfur and about 0.1–2 moles of a mercaptan compound selected from the group consisting of

(1) alkyl mercaptan selected from methyl mercaptan, ethyl mercaptan, n-propyl mercaptan, isopropyl mercaptan, isobutyl mercaptan, n-butyl mercaptan and tert-butyl mercaptan;

(2) cycloalkyl mercaptan containing 5–8 carbon atoms;

(3) aryl mercaptan containing 6–20 carbon atoms;

(4) alkaryl mercaptan containing 7–20 carbon atoms;

(5) aralkyl mercaptan containing 7–20 carbon atoms;

(6) polymercapto aromatic selected from 1,4-dimercaptobenzene, 1,2-dimercaptobenzene, and 1,4-dimercapto-2-methylbenzene; and

(7) dimercaptoalkane containing 2–10 carbon atoms at a temperature of about 50°–200° C.

4,188,298

SYNTHETIC AIRCRAFT TURBINE OIL

Russell R. Reinhard, Hopewell Junction, and Roberta Yaffe, Beacon, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed May 30, 1978, Ser. No. 910,718

Int. Cl.[2] C10M *1/48*

U.S. Cl. 252—46.6 **10 Claims**

1. A synthetic lubricating oil composition consisting of a major portion of an aliphatic ester base oil having lubricating properties formed from the reaction of pentaerythritol or a polypentaerythritol or trimethylolpropane and an organic monocarboxylic acid having from about 2 to 18 carbon atoms per molecule and:

(a) from about 0.3 to 5 percent by weight of the lubricating oil composition of a phenylnaphthylamine or an alkyl or alkaryl phenyl naphthylamine in which the alkyl radical has from 4 to 12 carbon atoms,

(b) from about 0.3 to 5 percent by weight of a dialkyldiphenylamine in which the alkyl radical has from 4 to 12 carbon atoms,

(c) from about 0.01 to 0.5 percent by weight of a polyhydroxy-substituted anthraquinone,

(d) from about 0.25 to 10 percent by weight of a hydrocarbyl phosphate ester in which said hydrocarbyl radical contains an aryl ring and contains from about 6 to 18 carbon atoms, and

(e) from about 0.01 to about 1.0 percent by weight of a dialkyl sulfide compound having the following formula:

$$R—S—R^1$$

wherein R and R^1 each can be a C_1–C_{14} straight chain or branched chain alkyl group or mixtures thereof.

3. A lubricating composition as claimed in claim 1 wherein said dialkyl sulfide compound is di-dodecyl sulfide.

4. A lubricating composition as claimed in claim 1 wherein said dialkyl sulfide compound is di-(2-ethylhexyl) sulfide.

4,188,299

OIL SOLUBLE DITHIOPHOSPHORIC ACID DERIVATIVES OF MERCAPTOTHIADIAZOLES

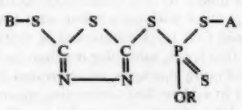
Gunter Caspari, Wheaton, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed May 17, 1978, Ser. No. 906,849

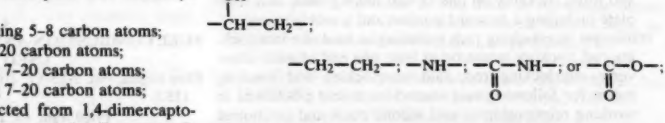
Int. Cl.[2] C10M *1/46, 1/54;* C07D *285/12*

U.S. Cl. 252—46.4 **18 Claims**

1. A compound having the structure:



wherein B is hydrogen or A and A is R—X—; X is



and R is a hydrocarbyl having about 1 to 100 carbon atoms.

2. A lubricating oil composition containing a major portion of a lubricating oil and about 0.1 to 10.0 weight percent of the compound of claim 1 based on the oil.

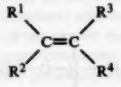
4,188,300

COSULFURIZED OLEFIN AND LARD OIL

Henry E. Sanson, III, Medford Lakes, and Wallace R. Hartman, Jr., Willingboro, both of N.J., assignors to Mayco Oil and Chemical Company, Inc., Bristol, Pa.

Filed Apr. 5, 1973, Ser. No. 348,458
Int. Cl.[2] C10M *1/38, 3/32;* C07G *17/00;* C08H *3/00*
U.S. Cl. 252—48.6 7 Claims

1. A composition comprising a cosulfurized blend of from 50 to 90 parts by volume of lard oil containing free fatty acid but below 0.5 weight percent calculated as oleic acid and having a pour point of 35° to 40° F., and from 50 to 10 parts by volume of a hydrocarbon containing from 2 to about 24 carbon atoms and having the structure



wherein R^1, R^2 and R^3 are either hydrogen or alkyl and R^4 is either hydrogen, alkyl, aryl, cycloalkyl or alkaryl, which cosulfurized blend contains chemically combined therewith from 5 to 25 weight percent as based on said blend of sulfur.

4,188,301

MAGNETIC RECORDING COMPOSITION

Tunehide Naruse; Yasushi Sasaki, and Yukio Matsumoto, all of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Mar. 19, 1979, Ser. No. 22,048
Claims priority, application Japan, Mar. 20, 1978, 53/31017
Int. Cl.[2] H01F *1/00;* G11B *5/70, 5/78*
U.S. Cl. 252—62.54 4 Claims

1. A magnetic recording composition comprising 65 to 90 wt % of a magnetic powder, corresponding by 35 to 10 wt % of a resinous binder, and triolein as a lubricant contained in an amount of 0.5 to 10 wt % of the binder.

4,188,302

MANUFACTURE OF ACICULAR COBALT-MODIFIED MAGNETIC IRON OXIDE

Haas-Juergen Becker, Goennheim; Christof Jaeckh, Heidelberg; Eberhard Koester, Frankenthal; Werner Loeser, Ludwigshafen; Manfred Ohlinger, Frankenthal, and Werner Steck, Mutterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 25, 1978, Ser. No. 872,262
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1977, 2705967
Int. Cl.[2] C01G *49/06*
U.S. Cl. 252—62.56 2 Claims

1. A method of preparing acicular magnetic iron oxide particles, said particles being modified with 0.5 to 10 percent by weight of cobalt and up to 24 percent by weight of divalent iron, each based on the amount of iron oxide, which comprises the steps of

(a) suspending acicular gamma-iron(III) oxide in water and bringing the pH of the suspension to neutral,

(b) passing nitrogen into the suspension while heating it at a temperature of from 50 to 100° C.,

(c) adding to the suspension an aqueous solution of a cobalt-(II) salt and a base in an amount required to achieve an hydroxyl ion concentration of at least 3.16×10^{-6} moles/-liter,

(d) introducing into the suspension an aqueous solution of an iron(II) salt,

(e) heating said suspension for at least 15 minutes at a temperature of from 50 to 100° C., said suspension having a hydroxyl ion concentration greater than 3.16×10^{-6} moles/liter,

(f) filtering off and washing the resulting precipitate until neutral,

(g) drying the precipitate at below 100° C., and

(h) heating the dried precipitate at from 100 to 200° C. until a TA value less than 3.5 is obtained.

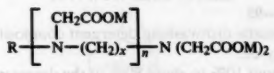
4,188,303

POLYMERIC ELECTRICAL INSULATORS HAVING INCREASED RESISTANCE TO PARTIAL DISCHARGES CONTAINING METAL CHELATES

Jean Barge, Paris la Defense; Raymond Catté, Lacq; Gilbert Chapelet, Symphorien d'Ozon; Ai Bui, Toulouse; Pierre Dejean, Sens; Claude Huraux, and Christian Mayoux, both of Toulouse, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Continuation of Ser. No. 588,207, Jun. 19, 1975, abandoned.
This application May 1, 1978, Ser. No. 902,007
Claims priority, application France, Jun. 21, 1975, 75 21779
Int. Cl.[2] H01B *3/18*
U.S. Cl. 252—63.7 20 Claims

1. An electrical insulator consisting essentially of a void-containing polymeric macromolecular insulating material suitable for use under voltage capable of causing partial discharges in said voids containing an agent for promoting an increase of the voltage thresholds liable to cause said partial discharges, said agent being present in an amount of 0.001 to 5 percent of said polymeric macromolecular insulating material, said agent being formed by at least one metal chelate which is a derivative of an organic compound of the formula



wherein

x is an integer of from 1 to 4,

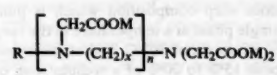
n is an integer of from 0 to 4,

R is —CH_2COOM and, when n is not 0, R may be —OH,

M is Na or H

the metal of the chelate being one selected from the group consisting of iron, copper, zinc, aluminum, cadmium and the metal chelate being present in the material in an amount sufficient to promote the extinction of said partial discharges.

15. In an electrical apparatus operative under high electrical field and voltage comprising a conductor and a void-containing macromolecular polymer insulator, said voids being liable to give rise to partial discharges, under such high electrical fields, the improvement, for promoting an increase of the voltage thresholds liable of causing said partial discharges in the voids of said insulator, wherein said insulator comprises from 0.001 to 5 percent by weight of at least one metal chelate which is a derivative of an organic compound of the formula



wherein

x is an integer of from 1 to 4,

n is an integer of from 0 to 4,

R is —CH_2COOM and, when n is not 0, R may be —OH,

M is Na or H

the metal of the chelate being one selected from the group consisting of iron, copper, zinc, aluminum and cadmium.

4,188,304

DETERGENT COMPOSITION IN A WATER-INSOLUBLE BAG HAVING A WATER-SENSITIVE SEAL

David E. Clarke; James F. Davies, both of Wirral, and John B. Tune, Higher Bebington, all of England, assignors to Lever Brothers Company, New York, N.Y.

Filed May 15, 1978, Ser. No. 905,680
Claims priority, application United Kingdom, May 18, 1977, 20934/77
Int. Cl.[2] C11D 17/04
U.S. Cl. 252—93 9 Claims

1. A detergent product comprising a particulate detergent composition contained within a closed water-insoluble bag which has a water-sensitive seal, whereby the contents of the bag are discharged on contact of the bag with water.

4,188,305

SURFACTANT FOR AN AUTOMATIC DISHWASHER

Linda A. Halas, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 22, 1977, Ser. No. 863,379
Int. Cl.[2] C11D 7/54, 7/60
U.S. Cl. 252—95 6 Claims

1. An automatic dishwashing detergent composition consisting essentially of:

(1) from about 10% to about 90% of the detergency builder;

(2) available chlorine at a level of from 0% to about 3%; and

(3) from about 2.5% to about 30% of a low foaming nonionic surfactant which is the condensate of an alcohol containing from 17 to 19 carbon atoms with from about 6 to about 15 moles of ethylene oxide per mole of fatty alcohol, at least 50% of the ethylene oxide homologs containing within ±2 ethylene oxide moieties of the average.

4,188,306

PUMPABLE SOAP

Alan Dillarstone, Bramhall; Norman Lowe, Flixton, and Edwin Cropper, Shaw, all of England, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 18, 1977, Ser. No. 825,802
Claims priority, application United Kingdom, Aug. 23, 1976, 34960/76
Int. Cl.[2] C11D 9/32, 17/04
U.S. Cl. 252—121 5 Claims

1. An aqueous soap composition which is pumpable and substantially single phase at a temperature in the range of about room temperature to about 70° C. and consists essentially of, by weight, about 15% to 30% of a sodium soap obtained by neutralizing a mixture of tallow fatty acids and nut oil C_8–C_{18} fatty acids with an aqueous sodium hydroxide, the weight ratio of tallow fatty acids to nut oil fatty acids being in the range of 100:1 to 1:1; a water-soluble sodium, potassium or ammonium salt of a C_1–C_4 alkylbenzene sulfonate, the weight ratio of said soap to said sulfonate being about 50:1 to 10:1 and being sufficient to maintain the viscosity of said composition in a pumpable range; and 50% to 80% of water.

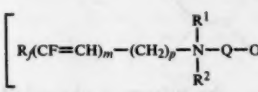
4,188,307

MIXTURE WITH LOW SURFACE TENSION WHICH CONSISTS OF FLUORINATED ALKYLAMMONIUM MONOALKYL SULFATES AND FLUOROALKYL-SULFATOBETAINES

Heinrich Bathelt, Altotting, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 1, 1978, Ser. No. 956,750
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1977, 2749330
Int. Cl.[2] B01F 17/04
U.S. Cl. 252—355 5 Claims

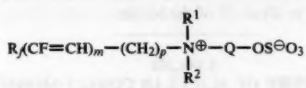
1. Mixture with low surface tension, containing 10 to 80% by weight, based on the mixture, of at least one compound of the formula



(I)

in which R_f denotes a perfluoroalkyl radical with 3 to 16 C atoms, R^1 denotes an alkyl radical with 1 to 4 C atoms, R^2 denotes an alkyl radical with 1 to 4 C atoms, a cyclohexyl radical or a 2-hydroxyalkyl radical with 2 to 4 C atoms, Q denotes a $-CH_2CH_2-$ or

radical, m denotes the number 0 or 1 and, if m is 0, p is an integer from 1 to 4 and if m is 1, p is the number 1, and 90 to 20% by weight, based on the mixture, of at least one compound of the formula



(II)

in which R_f, R^1, R^2, Q, m and p are as defined above.

4,188,308

CONVERSION OF PENDANT SULFONATE GROUPS TO SULFONIC ACID GROUPS ON PERFLUORVINYLETHER-TETRAFLUOROETHYLENE COPOLYMER CATALYSTS

Ronald J. Vaughan, Orinda, Calif., assignor to Varen Technology, Marshallton, Del.

Continuation-in-part of Ser. No. 660,634, Feb. 23, 1976. This application May 10, 1978, Ser. No. 904,503
Int. Cl.[2] B01J 31/40
U.S. Cl. 252—413 2 Claims

1. A method for reactivating a deactivated acid catalyst comprising a copolymer of perfluorovinyl ether and tetrafluoroethylene, said copolymer catalyst containing pendant sulfonic acid groups, said catalyst having become deactivated by use in a hydrocarbon conversion process, which reactivating method comprises contacting said deactivated catalyst with strong nitric acid to remove contaminants and to convert sulfonate groups into sulfonic acid groups, removing excess nitric acid and salt formed from such conversion by water washing said sulfonic acid group containing copolymer until the wash water has a pH above 4 and drying the washed acid copolymer catalyst at 50° to 200° C.

4,188,309

SHAPED CATALYST AND PROCESS FOR ITS PRODUCTION

Herbert Völker, Hanau; Edgar Koberstein, Alzenau; Alfred Bozon, Erlensee, and Jörg Hensel, Hanau, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 7, 1978, Ser. No. 913,461

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1977, 2745188

Int. Cl.[2] B01J *21/04, 23/78, 23/84, 21/12*

U.S. Cl. 252—466 J 51 Claims

1. A shaped catalyst consisting essentially of a structural reinforcing agent of ferrous metal, a layer of a heat-resistant carrier material on the structural reinforcing agent, a catalytically active component on the carrier material; the body of the structural reinforcing agent consisting essentially of iron or steel and having its surface provided with a non-scaling, adhesive and anchoring-favoring aluminum/iron diffusion layer, said diffusion layer having been obtained by tempering an aluminum-coated iron or steel at a temperature between 600 and 1200° C. for at least 1 minute.

4,188,310

SUBSTITUTED CYCLIC ALCOHOLS, METHODS OF PREPARING AND COMPOSITIONS CONTAINING SAME

Brian J. Willis, Bergenfield, and John M. Yurecko, Jr., Bayonne, both of N.J., assignors to Fritzsche Dodge & Olcott Inc., New York, N.Y.

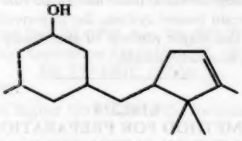
Filed Nov. 2, 1978, Ser. No. 957,047

Claims priority, application Japan, Sep. 30, 1977, 52-118070

Int. Cl.[2] A61K *7/46;* C11B *9/00;* C07C *35/21, 49/36*

U.S. Cl. 252—522 R 14 Claims

1. A compound having the structure



wherein the dashed line may be either a carbon-carbon single bond or a carbon-carbon double bond.

4,188,311

DETERGENT COMPOSITIONS CONTAINING ETHER SULFATES

Johan G. Aalbers, and Nicolaas I. Van Paassen, both of Bodegraven, Netherlands, assignors to Chem-Y, Fabriek Van Chemische Produkten B.V., Bodegraven, Netherlands

Filed Jul. 20, 1976, Ser. No. 707,092

Claims priority, application United Kingdom, Jul. 24, 1975, 31012/75

Int. Cl.[2] C11D *11/04*

U.S. Cl. 252—551 6 Claims

1. In a detergent composition consisting essentially of a detergent effective amount of detergent product and a detergent adjuvant, the improvement wherein said detergent product is of the formula $RO—(C_2H_4O)_nSO_3M$, wherein R is a mixture of alkyl groups having from about 10 to about 15 carbon atoms and containing at least about 30% of alkyl groups with branched carbon chains, n is a number having an average value of about 1 to about 5 and M is a cation, said detergent product having been prepared by ethoxylating the corresponding compound ROX with ethylene oxide using an acidic catalyst, followed by sulfation and conversion to the desired salt, and further wherein said detergent product and said detergent adjuvant are in aqueous solution and the composition further includes a thickening amount of sodium chloride.

4,188,312

SURFACE-COATING BINDERS AND THEIR USE FOR CATHODIC ELECTROCOATING

Fritz E. Kempter, Mannheim; Eberhard Schupp, Schwetzingen, and Rainer Blum, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 14, 1978, Ser. No. 969,551

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1977, 2755908

Int. Cl.[2] C25D *13/06;* C08L *63/00, 91/00*

U.S. Cl. 260—19 EP 16 Claims

1. A surface-coating binder which is substantially free from epoxide groups and is based on a reaction product of (A) from 25 to 90 percent by weight of a Mannich base obtained from

(a_1) one or more polyhydric phenols which are free from ether groups and contain two or more aromatic rings, and/or

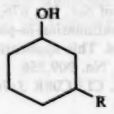
(a_2) one or more monohydric or polyhydric phenols which contain one or more ether groups and contain two or more aromatic rings, and

(b_1) one or more secondary amines which contain one or two hydroxyalkyl groups, or a mixture of (b_1) with

(b_2) a secondary dialkylamine or dialkoxyalkylamine, and

(c) formaldehyde or a formaldehyde donor,

and (B) from 75 to 10 percent by weight of one or more epoxy resins, wherein the reaction product of (A) and (B) additionally contains, built into its chemical structure, an olefinically unsaturated alkylphenol of the general formula (I)



where R is a radical of 11 to 19 carbon atoms which contains from one to three carbon-carbon double bonds.

4,188,313

COMPOSITIONS INTENDED FOR THE FLAMEPROOFING OF PLASTICS

Jacqueline Cerny, and Gilbert Vivant, both of Lyon, France, assignors to Rhone-Poulenc Industries, Paris, France

Filed May 28, 1976, Ser. No. 690,843

Claims priority, application France, Jun. 10, 1975, 75 18038

Int. Cl.[2] C08L *63/00*

U.S. Cl. 260—37 EP 8 Claims

1. Compositions for flameproofing plastics, which compositions are in particulate form and do not evolve toxic products when use is made of the plastics characterised in that the flameproofing composition consists of a mixture comprising

(a) 50 to 95% by weight of red phosphorus in the form of a powder having a mean particle size of less than 200μ and

(b) 5 to 50% by weight of epoxy resins, and in which the particles of red phosphorus are coated with the epoxy resin.

6. A plastic composition for the production of flameproofed shaped articles comprising a plastic, with or without filler, in which the plastic is flameproofed by admixture with 0.2 to 20% by weight of previously formed particles of 50 to 95% by weight red phosphorus and 5 to 50% by weight epoxy resin, in which in the preformed particles the phosphorus is coated with the epoxy resin compound.

4,188,314

SHAPED ARTICLE OBTAINED FROM A CARBONATE-POLYESTER COMPOSITION

Daniel W. Fox, Pittsfield, and John A. Rock, Dalton, both of Mass., assignors to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 750,511, Dec. 14, 1976, abandoned. This application Jun. 29, 1978, Ser. No. 920,256

Int. Cl.[2] C08L 67/00

U.S. Cl. 260—37 PC 11 Claims

1. A shaped article in the form of a substantially transparent sheet having enhanced chemical resistance which consists of:

(a) from 25 to 98 parts by weight of an aromatic carbonate polymer; and

(b) from 2 to 75 parts by weight of a polyester polymer derived from cyclohexanedimethanol and a mixture of iso- and terephthalic acids wherein said mixtures contain from about 5% to about 90% isophthalic acid and from about 95% to about 10% terephthalic acid.

4,188,315

PROCESS AND COMPOSITION FOR POLYMERIZING AND CURING METHYL METHACRYLATE MONOMER-POLYMER SYRUPS IN THE PRESENCE OF METAL SALTS OF HEMI-PERESTERS OF MALEIC ACID

Ronald S. Dudinyak, Wilmington, Del., assignor to E. I. Du Pont De Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 676,801, Apr. 14, 1076, abandoned, which is a continuation-in-part of Ser. No. 615,722, Sep. 22, 1975, abandoned. This application May 25, 1978, Ser. No. 909,556

Int. Cl.[2] C08K 3/10

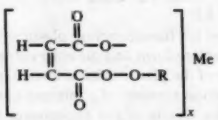
U.S. Cl. 260—40 R 5 Claims

1. An improved process for preparing a cured polymeric article which includes curing a mixture consisting essentially of

(a) a syrup containing 10–40% by weight of a methyl methacrylate polymer, having an inherent viscosity of 0.25–1.0, in monomeric methyl methacrylate, said polymer being selected from the group consisting of methyl methacrylate homopolymer and copolymers of methyl methacrylate with α,β-ethylenically unsaturated compounds;

(b) at least some inert additive, in an amount up to 85% by weight, based on the weight of (a) plus (b); and

(c) a small amount of a metal salt of a hemiperester of maleic acid having the formula



wherein

Me is a metal selected from the group consisting of Group IA metals, Group IIA metals, zinc, lead, cobalt, nickel, manganese and copper;

X is an integer having a value of from 1 to the valence of the metal; and

R is a saturated tertiary alkyl radical

wherein the improvement comprises the presence of a salt of an oxo acid of sulfur activator selected from the group consisting of bisulfite, metabisulfite and thiosulfate salts.

4,188,316

PROCESS FOR PRODUCING SHAPED ARTICLES WITH PATTERNS

Shuichi Sawada, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed May 27, 1977, Ser. No. 801,414

Claims priority, application Japan, Jun. 3, 1976, 51-64848

Int. Cl.[2] C08J 3/20

U.S. Cl. 260—40 R 13 Claims

1. A process for producing a molding compound with a controlled color pattern which comprises the steps of:

(a) preparing a plurality of unsaturated polyester resin compositions of different color tones and having fluidity, said compositions containing at least one thickening agent selected from the group consisting of metal oxide, metal hydroxide and crystalline unsaturated polyester;

(b) thickening at least one of a pair of said compositions sufficiently so that it loses its fluidity by allowing said composition to stand for a period of time at a temperature effective to cause said thickening;

(c) uniting the plurality of resin compositions after at least one of each pair of adjacent compositions to be united has been thickened sufficiently to lose its fluidity and determine physical boundary while retaining its uniting ability; and

(d) further thickening the whole of the united resin compositions to form a solid or semi-solid molding compound.

4,188,317

DENTAL RESTORATIVE COMPOSITIONS CONTAINING TITANIUM SILICATE

Samuel C. Temin, Needham, Mass., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Jul. 28, 1978, Ser. No. 929,069

Int. Cl.[2] C08K 3/24, 3/34

U.S. Cl. 260—42.53 10 Claims

1. In a dental restorative composite composition, which is a mixture of a finely divided, inert inorganic filler and a liquid polymerizable resin binder system, the improvement comprising, as at least the major portion of said finely divided inert inorganic filler, titanium silicate.

4,188,318

SIMPLIFIED METHOD FOR PREPARATION OF HIGH YIELD, HIGH PURITY FACTOR VIII CONCENTRATE

Edward Shanbrom, 2252 Liane La., Santa Ana, Calif. 92700

Continuation of Ser. No. 586,948, Jun. 16, 1975, abandoned. This application Apr. 24, 1978, Ser. No. 899,235

Int. Cl.[2] A61K 37/02

U.S. Cl. 260—112 B 1 Claim

1. The method of concentrating and purifying Factor VIII consisting essentially of the steps of:

collecting cryoprecipitate from about 100 or more liters of frozen plasma;

extracting the cryoprecipitate thus collected in from about 2 to about 3 volumes of pyrogen-free water at about 25° C. to 30° C. and about pH 7 for from about 30 to about 60 minutes;

removing lipids, denatured proteins and prothrombin complex from the extract solution by adsorption:

precipating fibrinogen its denatured and degraded products, without removal of significant amounts of Factor VIII from the resulting low ionic strength liquid extract by cooling the liquid to from about 1° C. to about 2° C. for from about one-half hour to about 2 hours;

separating, stabilizing, clarifying and sterilizing the supernatant liquid containing about eighty percent or more of the Factor VIII in the starting material;

lyophilizing the stabilized supernatant liquid to produce a Factor VIII concentrate which can be stored for long periods of time and which can be easily reconstituted by dissolution in distilled water or physiologic saline.

4,188,319

4-N-ACYLFORTIMICIN B DERIVATIVES AND THE CHEMICAL CONVERSION OF FORTIMICIN B TO FORTIMICIN A

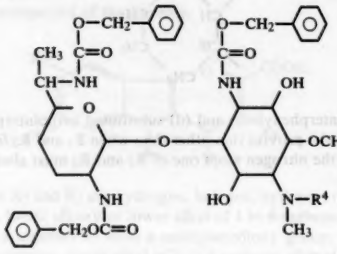
John S. Tadanier; Jerry R. Martin, and Paul Kurath, all of Waukegan, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 888,085, Mar. 20, 1978, Pat. No. 4,155,902, which is a division of Ser. No. 725,829, Sep. 23, 1976, Pat. No. 4,091,032. This application Jan. 12, 1979, Ser. No. 3,053

Int. Cl.[2] C07C *103/52;* A61K *37/00*

U.S. Cl. 260—112.5 R 20 Claims

1. A compound of the formula



wherein R^4 is acyl, N,N-diloweralkylaminoacyl, or an acyl group derived from an N-benzyloxycarbonyl protected amino acid or a short peptide.

4,188,320

ESTER OF HIGHER FATTY ACID AND REAGENT FOR DETERMINATION OF ACTIVITY OF LIPASE

Shinichi Kamachi, Mitaka, and Yosuke Ohkura, Fukuoka, both of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

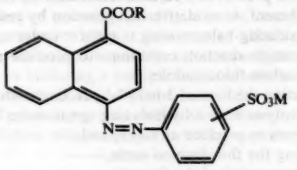
Filed Sep. 20, 1978, Ser. No. 943,981

Claims priority, application Japan, Sep. 22, 1977, 52-113206

Int. Cl.[2] C07C *107/04*

U.S. Cl. 260—202 11 Claims

1. An ester of higher fatty acid of the formula:



(wherein R is an alkyl group of 9 to 17 carbon atoms; M is an alkali metal).

4,188,321

25-DESACETYL RIFAMYCINS

Nicola Maggi, and Piero Sensi, both of Milan, Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

Filed Oct. 30, 1967, Ser. No. 679,195

Claims priority, application United Kingdom, Nov. 3, 1966, 49389/66

The portion of the term of this patent subsequent to Mar. 24, 1989, has been disclaimed.

Int. Cl.[2] C07D *491/08*

U.S. Cl. 260—239.3 P 4 Claims

1. 25-desacetyl-3-(4-methyl-piperizinyl-iminomethyl)-rifamycin SV.

4,188,322

PROCESS FOR THE PREPARATION OF 6-HALO-PREGNANES

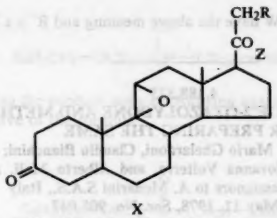
Pier P. Castelli, Monza, and Bruno Romanò, Besana Brianza, both of Italy, assignors to Biasinachim S.p.A., Milan, Italy

Filed Apr. 28, 1978, Ser. No. 900,886

Int. Cl.[2] C07J *71/00*

U.S. Cl. 260—239.55 R 9 Claims

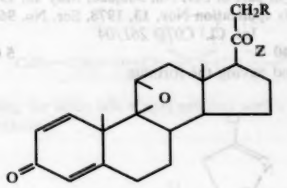
1. A process for the preparation of a 6α-halo-3-keto-$\Delta^{1,4}$-pregnadiene-derivative of the structure:



III

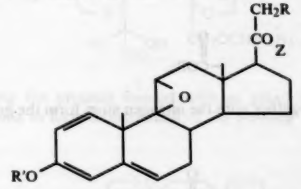
wherein R and Z are hydrogen, or hydroxy or acyloxy derived from carboxylic acids containing up to 9 carbon atoms; or when Z is hydroxy and W is hydroxy α-oriented can represent together the group

W is hydrogen or hydroxy or methyl; X is halogen, preferably fluorine and chlorine, which comprises reacting a 3-keto-$\Delta^{1,4}$-pregnadiene-derivative of the structure I:



I

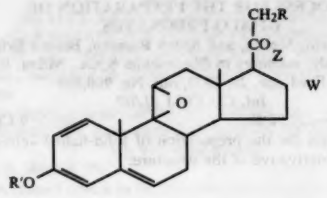
in which R,Z and W have the above meaning, with a suitable acylating or etherifying agent, such as acyl anhydrides, isopropenyl acetate, trialkyl orthoformates in the presence of acid catalysts, such as p-toluenesulfonic acid, to give the corresponding 3-enol-derivatives of the structure II:



II

wherein R,Z and W have the above meaning and R' is a lower acyl or alkyl, which is then reacted with a suitable halogenating agent such as a N-halo-amide, perchloryl fluoride to produce the desired compound III.

2. A compound of the structure:



II

wherein R,Z and W have the above meaning and R' is a lower acyl or alkyl.

4,188,323

DERIVATIVES OF 2-OXAZOLYDONE AND METHODS FOR PREPARING THE SAME

Vittorio Pestellini; Mario Ghelardoni; Claudio Bianchini; Piero Del Soldato; Giovanna Volterra, and Alberto Meli, all of Florence, Italy, assignors to A. Menarini S.A.S., Italy

Filed May 11, 1978, Ser. No. 905,047

Claims priority, application Italy, Sep. 22, 1977, 9578 A/77

Int. Cl.[2] C07D *263/24;* A61K *31/42*

U.S. Cl. 548—229 **6 Claims**

1. A member selected from the group consisting of 3-isopropyl-5-(1-naphthyloxymethyl)-2-oxazolydone; 3-isopropyl-5-(4-acetaminophenoxymethyl)-2-oxazolydone; 3-isobutyl-5-{2[(tetrahydrofurfuryl)oxy]phenoxy}methyl-2-oxazolydone; 3-n-octyl-4-methyl-5-(4-isopropylthiophenyl)-2-oxazolydone; 3-isopropyl-5-(4-nitrophenyl)-2-oxazolydone.

4,188,324

PURIFICATION OF AT-125

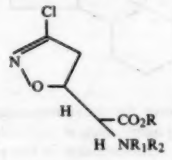
David G. Martin, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 918,569, Jun. 23, 1978, which is a continuation-in-part of Ser. No. 906,028, May 15, 1978, abandoned. This application Nov. 13, 1978, Ser. No. 960,217

Int. Cl.[2] C07D *261/04*

U.S. Cl. 548—240 **5 Claims**

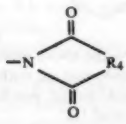
1. A compound having the formula



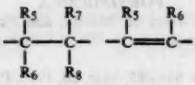
I

wherein R is selected from the group consisting of hydrogen and alkyl of from 1 to 8 carbon atoms; R_1 and R_2 are different and are selected from the group consisting of hydrogen,

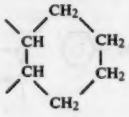
or when taken together with the nitrogen atom form the group



wherein R_3 is alkyl of from 1 to 8 carbon atoms, inclusive; and R_4 is selected from the group consisting of (a)



where R_5, R_6, R_7 and R_8 are selected from the group consisting of hydrogen and alkyl of from 1 to 5 carbon atoms, inclusive (b)



(c) orthointerphenylene, and (d) substituted orthointerphenylenes with the proviso that other than when R_1 and R_2 forms a ring with the nitrogen atom one of R_1 and R_2 must always be hydrogen.

4,188,325

ISATIN PROCESS AND PRODUCTS

Paul G. Gassman, St. Paul, Minn., and Berkeley W. Cue, Jr., Groton, Conn., assignors to Regents of University of Minnesota, Minneapolis, Minn.

Division of Ser. No. 787,992, Apr. 15, 1977. This application Aug. 21, 1978, Ser. No. 935,687

Int. Cl.[2] C07D *209/34*

U.S. Cl. 260—325 R **25 Claims**

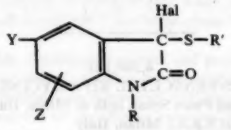
1. A process for making isatins which comprises the steps of

(1) subjecting a 3-hydrocarbonthiooxindole, having a hydrogen atom present as a further substituent on the 3-carbon atom thereof, to oxidative halogenation by reaction with an oxidating-halogenating agent under oxidative-halogenation reaction conditions to produce a 3-halo-3-hydrocarbon thiooxindole;

(2) subjecting the formed 3-halo-3-hydrocarbonthiooxindole to hydrolysis with a hydrolyzing agent under hydrolysis conditions to produce an isatin; and,

(3) isolating the thus-formed isatin.

10. The compound of the formula



wherein

X and Z are hydrogen, halogen, nitro, cyano, trifluoromethyl, lower alkyl, lower alkoxy, lower acyloxy, carbonyloxyl-lower alkyl, or carboxyloxy-phenyl;

R is hydrogen or a lower hydrogenated radical free of aliphatic unsaturation;

R' is a lower hydrocarbon radical; and

Hal is chlorine or bromine.

4,188,326
INDOLOPYRONES HAVING ANTI-ALLERGIC ACTIVITY

Richard E. Brown, Hanover, N.J., and Paul C. Unangst, Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

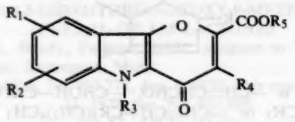
Continuation-in-part of Ser. No. 764,150, Jan. 31, 1977, abandoned, which is a continuation-in-part of Ser. No. 611,453, Sep. 8, 1975, Pat. No. 4,028,383. This application Mar. 20, 1978, Ser. No. 890,544

The portion of the term of this patent subsequent to Jun. 7, 1994, has been disclaimed.

Int. Cl.[2] **C07D** *491/04*

U.S. Cl. 260—326.29 **11 Claims**

1. A compound of the formula:



wherein R_1 and R_2 are hydrogen, halogen, hydroxy, trifluoromethyl, lower alkoxy or lower alkyl of 1 to 6 carbons, or may be taken together to form a methylenedioxy group; wherein R_3 is hydrogen, lower alkyl of 1 to 6 carbons, phenyl, or phenylmethyl; wherein R_4 is hydrogen; and wherein R_5 is hydrogen or lower alkyl of 1 to 6 carbons.

4,188,327
SULFOLENE HYDROGENATION

Donald H. Kubicek, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 8, 1978, Ser. No. 940,674

Int. Cl.[2] **C07D** *333/48*

U.S. Cl. 549—87 **14 Claims**

1. A process for converting sulfolene to sulfolane which comprises contacting

(a) a feed of at least one sulfolene compound containing sulfur dioxide and other sulfur-containing catalyst poisons with

(b) hydrogen in the presence of

(c) a metal hydrogenation catalyst, and

(d) an effective amount of sulfur dioxide neutralizers or scavengers comprising at least one of alkali metal and alkaline earth metal hypohalite salts under hydrogenation conditions including a temperature at which the reaction mixture is liquid and which is below that at which the materials decompose and sufficient to effectively convert said sulfolene compound to a sulfolane compound.

4,188,328
CHEMICAL INTERMEDIATES IN THE PREPARATION OF OXEPANE COMPOUNDS

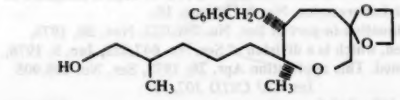
Michael P. Wachter, Bloomsbury, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Dec. 18, 1978, Ser. No. 970,726

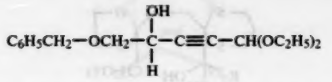
Int. Cl.[2] **C07D** *317/00*

U.S. Cl. 260—340.9 R **7 Claims**

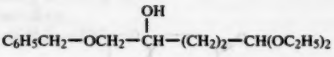
1. The process for the preparation of a compound of the formula:



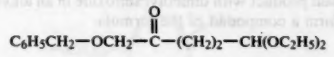
which comprises reacting a compound of the formula



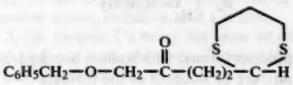
with hydrogen in the presence of a catalyst to produce a hydrogenated compound of the formula



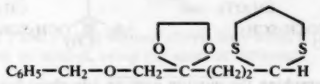
oxidizing the product with an oxidizing agent to form a ketone derivative of the formula



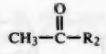
reacting said product with an alkyl thiol to form a 1,3-dithiane of the formula



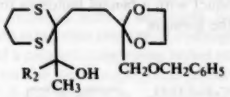
reacting said product with ethylene glycol to form a ketal of the formula



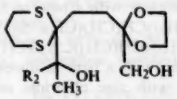
condensing the lithio salt of said product with a methyl ketone of the formula



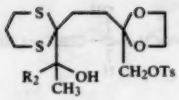
to form an acyclic tertiary alcohol of the formula



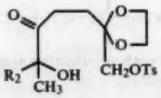
reacting the product formed with an alkali metal in liquid ammonia to form a compound of the formula



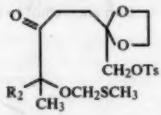
reacting said product with tosyl chloride to form a tosylate of the formula



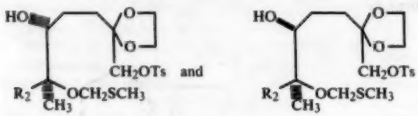
removing the dithiane protecting group to form a ketone of the formula



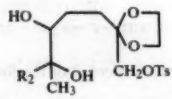
reacting said product with dimethyl sulfoxide in an alkyl anhydride to form a compound of the formula



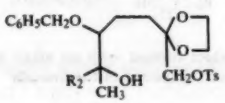
reacting the product formed with sodium borohydride to form an epimeric mixture of alcohols of tl.e formula



chromatographing the mixture over an adsorbent material to separate the isomers, reacting the erythro isomer with a mixture of mercuric chloride and calcium carbonate to form an erythro diol of the formula



reacting said product with a benzyl halide to form an erythro benzyl ether of the formula



and reacting said product with a base in dimethyl sulfoxide, wherein R_2 is $-CH_2)_3CH(CH_3(CH_2OSi(C_6H_5)_2t\text{-}C_4H_9$; and wherein R_2 is $(CH_2)_3CH(CH_3)CH_2OCH_2OCH_2CH_2OCH_3$ reacting said product with a base in dimethyl sulfoxide followed by reaction with zinc chloride; and wherein R_2 is $-(CH_2)_3C(CH_3)=CH_2$ reacting the product with a base in dimethyl sulfoxide followed by reaction with borane methylsulfide.

4,188,329

INTERMEDIATES FOR THE PREPARATION OF PROSTAGLANDINS AND PROSTAGLANDIN ANALOGS FROM A MOLD METABOLITE

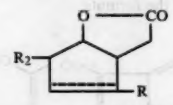
Lester A. Mitscher; George W. Clark, III, both of Lawrence, Kans., and Gordon H. Bokelman, Vancouver, Canada, assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 707,726, Jul. 22, 1976, Pat. No. 4,103,091, which is a continuation-in-part of Ser. No. 611,468, Sep. 8, 1975, abandoned. This application May 11, 1978, Ser. No. 904,831

Int. Cl.[2] C07D *307/93*

U.S. Cl. 260—343.3 P **10 Claims**

1. A compound of the formula



wherein R is —CH=CHCHO, —CHOH—CHOH—CH_3, —CH=$CHCH_3$ or —CH=CH—$CR_5(CH_2)_4CH_3$ with R_5 being =O or

the broken line in the cyclopentene ring indicates an optional double bond; and R_2 is an O-protective acyl group that can be removed chemically without adverse effect on the other substituents of said cyclopentene, said substituent being in the β-position.

4,188,330

SUBSTITUTED PHTHALIDE DERIVATIVES

Thomas J. Giacobbe, Concord, and Halbert C. White, Clayton, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

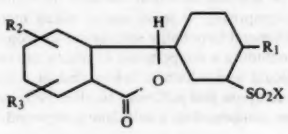
Filed Oct. 10, 1978, Ser. No. 949,479

Int. Cl.[2] C07D *307/88*

U.S. Cl. 260—343.3 R **3 Claims**

1. A compound of the formula

(II)



wherein R_1 represents chloro, bromo, NR'R", lower alkyl or lower alkoxy radicals, R_2 and R_3 each independently represent hydrogen, chloro, bromo, nitro or lower alkyl radicals, and X represents chloro or bromo, R' and R" each independently representing hydrogen, lower alkyl, lower alkenyl or lower hydroxyalkyl radicals.

4,188,331

PROSTAGLANDIN DERIVATIVES

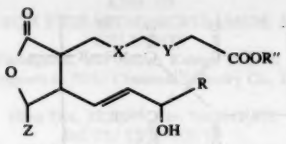
Andre G. Pernet, Kirkland, Canada; Hiromasa Nakamoto, Awara, and Naoyasu Ishizuka, Ou, both of Japan, assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 746,022, Nov. 30, 1976, abandoned, which is a division of Ser. No. 647,822, Jan. 9, 1976, abandoned. This application Apr. 26, 1978, Ser. No. 899,905

Int. Cl.[2] C07D *307/32*

U.S. Cl. 260—343.6 **5 Claims**

1. A compound of the formula



wherein R is a linear, branched or cyclic alkyl group of 3 to 7 carbon atoms; Z is OH or CH_2OH, X is —CH=CH— or —C≡C—; Y is O or CH_2 and R'' is H or loweralkyl.

4,188,332

TRANS-2,3-DIDEHYDRO-9-DEOXY-9-METHYLENE-PGF,1,11- OR 1,15-LACTONES

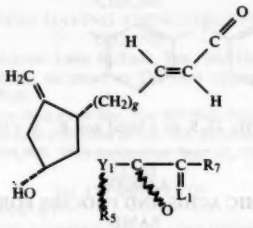
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 893,771, Apr. 5, 1978. This application Aug. 11, 1978, Ser. No. 932,995

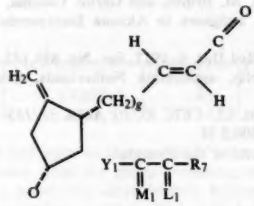
Int. Cl.[2] C07D *313/00*

U.S. Cl. 260—343.41 **22 Claims**

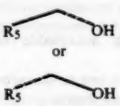
1. A prostaglandin of the formula



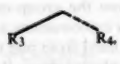
or



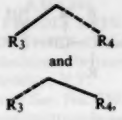
wherein Y_1 is trans—CH=CH—, —C≡C—, $—CH_2CH_2—$, or cis—CH=CH—;
wherein M_1 is



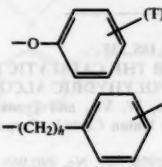
wherein R_5 is hydrogen or methyl;
wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein g is 4, 5, or 6;
wherein R_7 is
(1) $—(CH_2)_m—CH_3$,

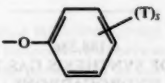


(2)

, or

(3)

wherein h is zero, one, two, or three,
wherein m is one to 5, inclusive, T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl, with the further proviso that R_7 is



wherein T and s are as defined above, only when R_3 and R_4 are hydrogen or methyl, being the same or different.

4,188,333

PROCESS FOR SELECTIVELY HYDROGENATING POLYENIC COMPOUNDS IN OILS

Raymond M. Cahen, 21, avenue Commandant Lothaire, 1040 Brussels, Belgium

Filed Oct. 25, 1977, Ser. No. 845,061

Claims priority, application Luxembourg, Jan. 18, 1977, 76591

Int. Cl.[2] C11C *3/12*; B01J *23/40*

U.S. Cl. 260—409 **13 Claims**

1. A process for selectively hydrogenating oils containing polyenic compounds into oils wherein the content of polyenic compounds is reduced with a minimum formation of solid products, which comprises the step of hydrogenating said oil in the presence of a catalyst comprising nickel on a titanium oxide carrier, wherein the per weight ratio of nickel:carrier is between about 1.5 and about 4.5.

4,188,334

ORGANOTIN COMPOUNDS

Wolfgang Wehner, Zwingenberg, and Hermann O. Wirth, Bensheim, both of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

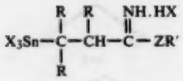
Filed Sep. 6, 1978, Ser. No. 939,944

Claims priority, application Switzerland, Sep. 9, 1977, 11065/77

Int. Cl.[2] C07F *7/22*

U.S. Cl. 260—429.7 **6 Claims**

1. An organotin compound of the general formula



wherein

X is a chlorine, bromine or iodine atom,

R is selected from the group consisting of a hydrogen atom and alkyl,

Z is an oxygen or sulphur atom, and

R′ is a hydrocarbon group of aliphatic, cycloaliphatic or aromatic character, or said group substituted by a hydroxyl, thiol, alkoxy, alkylthio, carboxyl or carboalkoxy group.

4,188,335

NOVEL SOLVENTS FOR THE CATALYTIC PROCESS FOR PRODUCING POLYHYDRIC ALCOHOLS

Leonard Kaplan, Charleston, W. Va., and Frank A. Cotton, Bryan, Tex., assignors to Union Carbide Corporation, New York, N.Y.

Filed Mar. 28, 1978, Ser. No. 890,969

Int. Cl.[2] C07C *27/06*

U.S. Cl. 260—449 L **13 Claims**

1. The process for producing polyhydric alcohol(s) which comprises reacting hydrogen and oxides of carbon in a solvent comprising a 2,2-di(alkyl)-gamma-butyrolactone wherein the alkyl groups have from 1 to 12 carbon atoms, in the presence of a rhodium carbonyl complex at a temperature of between about 100° C. and 375° C. and a pressure of between about 1000 psia. and 50,000 psia. to produce said polyhydric alcohol(s).

4,188,336

CONVERSION OF SYNTHESIS GAS TO AROMATIC HYDROCARBONS

Clarence D. Chang, Princeton, and William H. Lang, Pennington, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 825,622, Aug. 18, 1977. This application May 5, 1978, Ser. No. 903,270

Int. Cl.[2] C07C *1/04*

U.S. Cl. 260—449 R **5 Claims**

1. In a process for forming hydrocarbons containing improved yields of aromatics by converting syngas comprising hydrogen and carbon oxides with a catalyst composition comprising a methanol synthesis catalyst component in admixture with a crystalline zeolite component comprising a silica-to-alumina ratio greater than 12, a pore dimension greater than about 5 Angstroms and a constraint index in the range of 1 to 12, the improvement which comprises

admixing each of the components of the methanol catalyst comprising zinc, chromia and alumina and the crystalline zeolite component in a fine state of sub-division finer than 80 mesh and thereafter pelletizing the mixed finely ground material to form particles of the catalyst composition of a particle size in the range of 10 to 30 mesh.

4,188,337

NITRILE SUBSTITUTED POLYIMIDE PRECURSORS

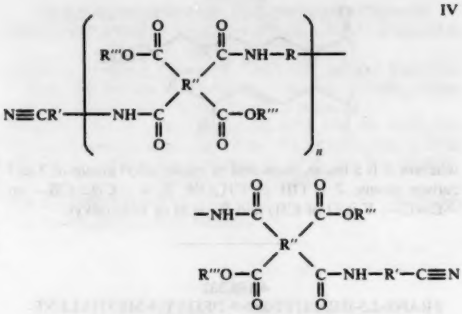
Norman Bilow, Los Angeles; Abraham L. Landis, Northridge, and Leroy J. Miller, Canoga Park, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 702,818, Jul. 6, 1976, Pat. No. 4,129,570. This application Jul. 28, 1978, Ser. No. 929,046

Int. Cl.[2] C07C *121/78*

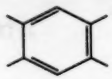
U.S. Cl. 260—465 D **5 Claims**

1. A compound of the following structure



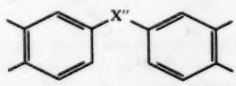
IV

wherein R is arylene ether or arylene thioether, R′ is arylene or arylene ether, n is an average from 1 to about 4, R″ is



II

or



III

X″ is C═O, CH_2, O, S, or a bond and R‴ is a lower alkyl.

4,188,338

HYDROXAMIC ACIDS AND PROCESS FOR MAKING SAME

Antonius H. N. M. Bruins, and Gerlof Vollema, both of Oss, Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

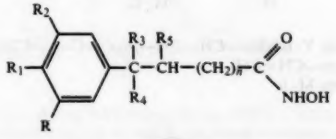
Filed Dec. 9, 1977, Ser. No. 859,142

Claims priority, application Netherlands, Dec. 18, 1976, 7614113

Int. Cl.[2] C07C *83/10*; A61K *31/185*

U.S. Cl. 260—500.5 H **16 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable non-toxic salt thereof, wherein:

(a) R is alkoxy of from one to six carbon atoms or alkenyloxy of two to six carbon atoms;

(b) R_1 is selected from the group consisting of hydrogen, alkoxy of one to six carbon atoms, alkenyloxy of two to six carbon atoms, alkyl from one to six carbon atoms, and benzyloxy;

(c) R_2 is selected from the group consisting of hydrogen, alkoxy of one to six carbon atoms, alkenyloxy of two to six carbon atoms and alkyl from one to six carbon atoms;

(d) R_3 and R_4 are selected from the group consisting of hydrogen or alkyl of one to six carbon atoms;

(e) R_5 is hydrogen or together with R_3 or R_4 methylene, and

(f) n signifies the number 1.

4,188,339

PROCESS FOR PREPARING ACRYLAMIDE AQUEOUS SOLUTION

Yasumasa Yamaguchi, and Kazuo Kohno, both of Yokohama, Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed Oct. 19, 1977, Ser. No. 843,472
Int. Cl.[2] C07C *103/08*
U.S. Cl. 260—561 N 11 Claims

1. A process for preparing an aqueous solution of acrylamide, which comprises

catalytically hydrating acrylonitrile in the presence of a metal-containing catalyst to form a mixed aqueous solution containing about 15 to about 35% by weight of acrylamide and about 0.5 to about 20% by weight of acrylonitrile, then flash distilling the mixed aqueous solution obtained by hydration, and then

concentrating the mixed aqueous solution obtained by flash distilling to a high concentration aqueous solution of acrylamide having an acrylonitrile concentration of about 0.1% by weight or less using a centrifugal film evaporator in which a stream of mixed aqueous solution and a stream of evaporated vapor flow countercurrently to each other and without using a distillation tower.

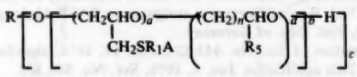
4,188,340

POLYETHERS HAVING AMINOTHIOETHER SIDE CHAINS

Richard A. Hickner, Lake Jackson, Tex., and Hugh A. Farber, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 427,605, Dec. 26, 1973, abandoned, which is a division of Ser. No. 846,946, Aug. 1, 1969, Pat. No. 3,804,900. This application Sep. 15, 1975, Ser. No. 613,662
Int. Cl.[2] C07C *93/06*
U.S. Cl. 260—567.6 P 11 Claims

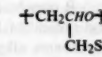
1. A polyether represented by the general statistical formula:



wherein R is hydrogen or the residue of an active hydrogen initiator selected from the group consisting of monohydric alkyl alcohols, polyhydric alkyl alcohols, hydroxyl terminated polyalkylene polyethers and haloalkyl alcohols; R_1 is alkylene, cycloalkylene, hydroxyalkylene, having 2 to 12 carbon atoms wherein the hydroxy group is bonded to a carbon at least one carbon removed from S, alkylenethioalkylene, poly(alkylenethio)alkylene, alkyleneoxyalkylene, poly(alkyleneoxy)alkylene, arylene or arylenealkylene wherein R_1 has at least 2 carbons and each of 2 valences exist on a different carbon; A is an ammonium salt radical represented by the general formula:

$$-N^{\oplus}R_2R_3R_4{}^{\ominus}X$$

wherein R_2 and R_3 are individually hydrogen, alkyl or hydroxyalkyl, R_4 is hydrogen or alkyl and X is an anion of an ammonium salt group; R_5 is hydrogen or alkyl; a is a positive integer and d is 0 or a positive integer provided that the ratio of a to d is such that the polyether contains at least 10 mole percent of



b is a positive integer; c is a positive integer; and n is a positive integer from 1 to 4.

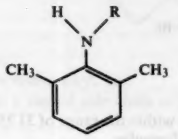
4,188,341

PROCESS FOR THE PRODUCTION OF (SUBSTITUTED) 2,6-DIMETHYLANILINES

Hanspeter Fischer, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 759,144, Jan. 13, 1977, abandoned, which is a continuation-in-part of Ser. No. 632,744, Nov. 17, 1975, abandoned. This application Jul. 11, 1978, Ser. No. 923,608
Int. Cl.[2] C07C *85/06, 85/08*
U.S. Cl. 260—573 8 Claims

1. Process for the production of aniline derivatives of the formula I

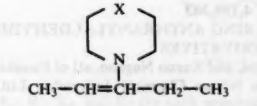


(I)

wherein

R represents hydrogen, C_1–C_4-alkyl or C_1–C_4-alkyl substituted by C_1–C_2-alkoxy,

in which process an enamine of the formula II



(II)

wherein X represents a methylene group, oxygen or a direct bond, is reacted at a temperature of between −30° C. and 150° C. with acrolein in the presence of an inert aprotic solvent, or in the absence of a solvent; and the reaction product obtained is subsequently heated to a temperature of between 100° and 400° C. in the presence of a hydrogen-transfer catalyst and in the presence of an amine of the formula III

$$R-NH_2 \qquad \text{(III)}$$

wherein R has the meaning given under formula I.

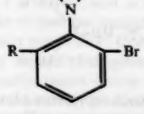
4,188,342

ORTHO-BROMINATION OF ORTHO-ALKYLATED ANILINES

John P. Chupp, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

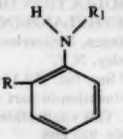
Filed Jan. 22, 1979, Ser. No. 5,057
Int. Cl.[2] C07C *87/28, 91/06, 91/16, 91/40*
U.S. Cl. 260—578 10 Claims

1. Process for the preparation of compounds having the formula



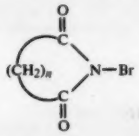
I

which comprises reacting a compound of the formula



II

with a compound of the formula



III

in an inert solvent at temperatures within the range of 31 25° C. to 125° C., wherein in the above formulae

R is C_{1-16} alkyl,

R_1 is hydrogen, C_{1-6} alkyl or an alkoxyalkyl radical of the formula $-(CR_2R_3)_mOR_4$ wherein R_2 and R_3 are hydrogen or C_{1-3} alkyl, m is 2, 3 or 4 and R_4 is C_{1-4} alkyl and n is an integer from 1 to 8 inclusive.

4,188,343

PROCESS FOR PREPARING ANTHRANYLALDEHYDE DERIVATIVES

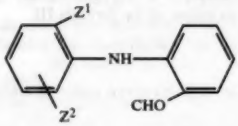
Ryozo Sakoda; Isao Hashiba, and Kazuo Nagano, all of Funabashi, Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Filed Dec. 27, 1978, Ser. No. 973,599

Int. Cl.[2] C07C *91/161, 91/28*

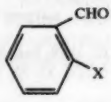
U.S. Cl. 260—571 **7 Claims**

1. The process for preparing an anthranylaldehyde derivative of formula:

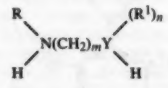


(wherein, Z^1 and Z^2 are same or different each other and each represent a hydrogen atom, a halogen atom, a methyl group or a trifluoromethyl group; Z^1 is attached to ortho position to the amino group and Z^2 may be positioned at any of 3-, 4-, 5- and 6-positions), which comprises steps of

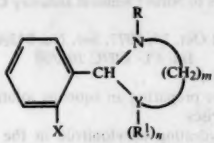
(1) reacting a o-halogenobenzaldehyde of the formula:



(wherein, X represents a halogen atom) with an alkylamine derivative of formula:

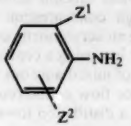


(wherein, R and R^1 each represents a lower alkyl group; Y represents a nitrogen, oxygen or sulfur atom; m represents an integer of 2 or 3; n represents 0 or 1, provided that n is 1 when Y is a nitrogen atom and n is 0 when Y is an oxygen or sulfur atom), affording a compound of formula:



(wherein, X, R, R^1, m and n are as defined above),

(2) reacting the thus obtained compound with an aniline derivative of formula:



(wherein, Z^1 and Z^2 are as defined above), giving a condensation product, and,

(3) treating the thus obtained condensation product with an acid.

4,188,344

PRODUCTION OF 4-(M,M'-DITERT.-BUTYL-P-HYDROXYPHENYL)-BUTAN-2-ONES

Roman Fischer, Mutterstadt; Werner Fliege, Otterstadt; Wolfgang Koernig, Mannheim, and Bernd Meissner, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

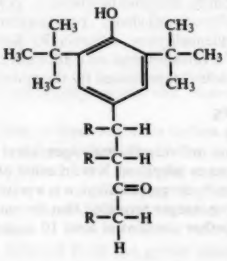
Continuation of Ser. No. 443,826, Feb. 19, 1974, abandoned. This application Jan. 3, 1978, Ser. No. 866,382

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1973, 2309370

Int. Cl.[2] C07C *45/00*

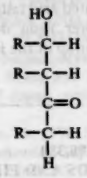
U.S. Cl. 260—590 E **6 Claims**

1. A process for the production of a 4-(m,m'-ditert.-butyl-p-hydroxyphenyl)-butan-2-one of the formula (I):



(I)

in which the individual radicals R may be identical or different and each is hydrogen, an alkyl radical of 1–4 carbon atoms or the said alkyl bearing as substituents alkyl groups or alkoxy groups in each case of 1–3 carbon atoms, or nitro groups wherein 2,6-ditert.-butylphenol is reacted with a 4-hydroxybutanone-(2) of the formula (II):



(II)

in which R has the meanings given above, in the presence of acid having an acid exponent (pKs) of from −7 to +2.16 at an elevated temperature of from 30° to 160° C.

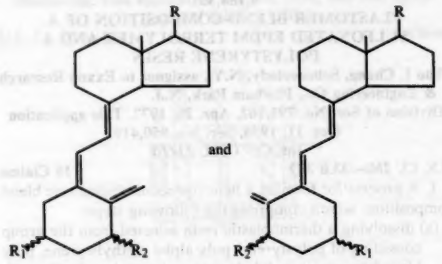
4,188,345

FLUOROVITAMIN D COMPOUNDS AND PROCESSES FOR THEIR PREPARATION

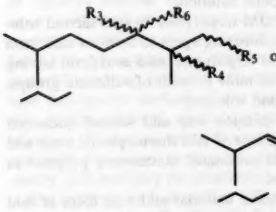
Hector F. DeLuca; Heinrich K. Schnoes; Joseph L. Napoli, Jr., and Bruce L. Onisko, all of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Jul. 26, 1978, Ser. No. 928,279
Int. Cl.[2] C07C *41/00*
U.S. Cl. 568—665 **5 Claims**

1. A method for the preparation of fluorovitamin D compounds and fluoro-5,6-trans-vitamin D compounds of the formulae



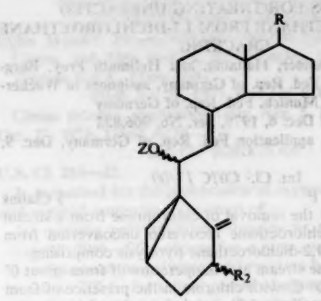
where R is a steroid side chain of the configuration



R_1 is O-acyl or hydroxy,

R_2, R_3, R_4, and R_5 are each selected from the group consisting of hydrogen, hydroxy, O-lower O-acyl alkyl, and fluoro, except that at least one of R_2, R_3, R_4, and R_5 must be fluoro, and

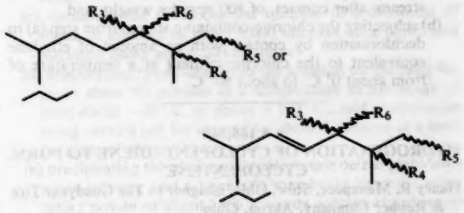
R_6 is hydrogen or lower alkyl, which comprises treating 3,5-cyclovitamin D compounds of the formula



where

Z is lower alkyl, and

R is a steroid side chain of the configuration



R_2, R_3, R_4, and R_5 are each selected from the group consisting of hydrogen, hydroxy, O-acyl, O-lower alkyl and fluoro, except that at least one of R_2, R_3, R_4, and R_5 must be hydroxy, and

R_6 is hydrogen or lower alkyl, with a dialkylaminosulfur trifluoride, recovering the fluorinated product, subjecting the recovered product to acid catalyzed solvolysis whereby a product containing in admixture fluorovitamin D and fluoro-5,6-trans-vitamin D products is obtained, chromatographically separating said products and recovering each of them.

4,188,346

DEHYDROHALOGENATION OF (POLYHALOALKYL)BENZENES

Lowell D. Markley, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 18, 1978, Ser. No. 906,894
Int. Cl.[2] C07C *25/00*
U.S. Cl. 260—651 F **6 Claims**

1. A process for the dehydrohalogenation of a (polyhaloalkyl)arene wherein in the polyhaloalkyl one halogen is a benzylic chlorine or benzylic bromine and at least one halogen is a non-benzylic halogen which process comprises contacting said (polyhaloalkyl)arene with a catalytic amount of a suitably active neat form of a Lewis acid selected from the group consisting of a halide of titanium treated with from about 0.1 to about 2 moles of water per mole of titanium halide and a halide of antimony under dehydrohalogenation conditions in the liquid phase at a temperature below 100° C. such that the benzylic halogen is selectively eliminated to form a (haloalkenyl)arene.

4,188,347

PROCESS FOR TREATING UNREACTED 1,2-DICHLOROETHANE FROM 1,2-DICHLOROETHANE CRACKING

Ludwig Schmidhammer, Haiming, and Hellmuth Frey, Burghausen, both of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 6, 1978, Ser. No. 966,832

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1977, 2754891

Int. Cl.[2] C07C *17/00*

U.S. Cl. 260—652 P 5 Claims

1. A process for the removal of chloroprene from a stream comprising 1,2-dichloroethane recovered unconverted from the products of a 1,2-dichloroethane pyrolysis comprising:

(a) contacting the stream at a temperature of from about 0° C. to about 80° C. with chlorine in the presence of from about 0.0001 to about 0.01 weight percent relative to the unconverted 1,2-dichloroethane of a substance selected from the group consisting of ortho-cresol, meta-cresol, chlorinated derivatives of ortho- and meta-cresols, and mixtures thereof, the amount of chlorine utilized being such as to produce a maximum chlorine content in the stream, after contact, of 800 ppm by weight; and

(b) subjecting the chlorine-containing stream from step (a) to dechlorination by contact with an amount of ethylene equivalent to the chlorine content at a temperature of from about 0° C. to about 80° C.

4,188,348

HYDROGENATION OF CYCLOPENTADIENE TO FORM CYCLOPENTENE

Henry R. Menapace, Stow, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 11, 1978, Ser. No. 932,874

Int. Cl.[2] C07C *5/06, 5/14, 5/16*

U.S. Cl. 585—274 3 Claims

1. In the process for selectively hydrogenating cyclopentadiene to form cyclopentene in the presence of a catalyst comprising (A) a hydrocarbon-soluble nickel compound selected from nickel salts of carboxylic acids and organo nickel compounds, (B) organo reducing agent corresponding to the formulae:

wherein R_1 is a monovalent hydrocarbon radical or hydrogen, and R_2 and R_3 are monovalent hydrocarbon radicals with 1 to 20 carbon atoms, and R-Li wherein R is a monovalent hydrocarbon radical with 1 to 20 carbon atoms and (C) pyridine, the improvement comprising employing the reducing agent, the soluble nickel compound and the pyridine in amounts wherein the mole ratio of aluminum or lithium to nickel ranges from 7/1 to 11/1, and the mole ratio of the pyridine to the nickel compound ranges from 1/1 to 2.5/1.

4,188,349

PROCESS FOR CURING UNSATURATED POLYESTERS UTILIZING NOVEL INITIATORS

Kenneth H. Markiewitz, and Alfred J. Restaino, both of Wilmington, Del., assignors to ICI Americas Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 673,539, Apr. 5, 1976. This application Jun. 21, 1977, Ser. No. 808,778

Int. Cl.[2] C08G *59/02, 59/13;* C08F *4/00;* C08G *18/04*

U.S. Cl. 525—366 32 Claims

1. A method of curing or crosslinking an ethylenically unsaturated ester resin susceptible to free radical polymerization which comprises initiating the curing or crosslinking by contacting the resin with an effective amount of dissolved initiating compound of the formula $R_1—N—(CH_2COOH)_2$ where R_1 is substituted or unsubstituted aryl radical, provided that the ethylenically unsaturated ester resin does not contain any group with which the acid group of the initiator will preferentially react chemically.

4,188,350

OLEFIN POLYMER BLENDS AND FILMS THEREFROM

Stephen J. Vicik, Darien; William J. Kohler, Westmont, both of Ill., and James O. Funderburk, Jr., Brookfield Center, Conn., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jan. 17, 1978, Ser. No. 870,137

Int. Cl.[2] C08L *23/16*

U.S. Cl. 525—232 26 Claims

1. A polymer resin mixture comprising:

a propylene-ethylene copolymer having a high isotactic molecular structure, containing up to about 6% by weight ethylene, and having a melt flow of from about 1.5 to about 18 decigrams per minute;

a (butene-1)-ethylene copolymer having a high isotactic molecular structure, containing from about 1% to about 10% by weight ethylene, and having a melt flow of from about 0.1 to about 5.0 decigrams per minute; and

a thermoplastic elastomer selected from the group consisting of ethylene-propylene copolymers and ethylene propylene diene terpolymers, the ratio by weight of said propylene-ethylene copolymer to said (butene-1)-ethylene copolymer being from about 2:1 to about 1:2 and said thermoplastic elastomer being present from about 10% by weight to about 50% by weight.

4,188,351

ELASTOMER BLEND COMPOSITION OF A SULFONATED EPDM TERPOLYMER AND A POLYSTYRENE RESIN

Chan I. Chung, Schenectady, N.Y., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 791,162, Apr. 26, 1977. This application Oct. 11, 1978, Ser. No. 950,419

Int. Cl.[2] C08L *23/16*

U.S. Cl. 260—33.6 AQ 16 Claims

1. A process for forming a heterogeneous elastomeric blend composition, which comprises the following steps:

(a) dissolving a thermoplastic resin selected from the group consisting of polystyrene, poly alpha methylstyrene, poly t-butylstyrene or polyhalo-styrene in a non-reactive solvent to form a first solution;

(b) dissolving an EPDM terpolymer in said non-reactive solvent to form a second solution;

(c) sulfonating said EPDM terpolymer in said second solution with a suitable sulfonating agent to form an acid form of a sulfonated EPDM terpolymer, said acid form having about 0.2 to about 10.0 mole percent of sulfonate groups;

(d) quenching said second solution;

(e) blending said first solution into said second quenched solution to form a mixture of said thermoplastic resin and said acid form of said sulfonated elastomeric polymer in said blended solutions;

(f) neutralizing with a basic material said acid form of said sulfonated EPDM terpolymer in said blended solutions; and

(g) steam stripping said blended solutions to remove the elastomeric blend composition, said blend composition comprising said neutralized sulfonated EPDM terpolymer and about 1 to about 20 parts per hundred by weight of said thermoplastic resin based on 100 parts by weight of neutralized sulfonated EPDM terpolymer.

4,188,352

ELASTOMERIC COMPOSITION COMPRISING FLUOROELASTOMER AND EPICHLOROHYDRIN ELASTOMER

Takeshi Suzuki, Nagaokakyo; Yasuyoshi Furukawa, Ikedaminamimachi; Masayasu Tomoda, Ootsu, and Yutaka Ueta, Osaka, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Dec. 29, 1978, Ser. No. 974,239

Claims priority, application Japan, Dec. 30, 1977, 52/160343

Int. Cl.[2] C08L *27/14, 27/16, 27/20*

U.S. Cl. 525—187 13 Claims

1. An elastomeric composition which comprises a fluoroelastomer, an epichlorohydrin elastomer, an acid-acceptor, a curing accelerator and a fluorine-containing polyhydroxy compound wherein the proportion of the fluoroelastomer and the epichlorohydrin elastomer is from 95:5 to 5:95 by weight.

4,188,353

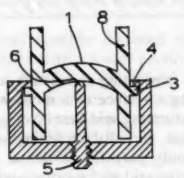
METHOD OF MAKING ASPHERIC LENSES

Charles W. Neefe, Box 429, Big Spring, Tex. 79720

Continuation-in-part of Ser. No. 874,934, Feb. 3, 1978, which is a continuation-in-part of Ser. No. 793,388, May 25, 1977, abandoned. This application Jan. 22, 1979, Ser. No. 5,598

Int. Cl.[2] B29D *11/00*

U.S. Cl. 264—1 1 Claim



1. A method of casting and removing from a resinous lens mold an aspheric optical lens of polymeric material, said mold of resinous material having at one end a cup-like molding cavity with a spherical optical surface and at the other end an opening, heating the resinous mold to a working temperature below the glass transition temperature of the resinous mold material, applying sufficient external pressure against the bottom non-optical surface of the cup-like molding cavity to change the spherical optical surface to an aspheric surface, allowing the resinous mold to cool before removing the external applied pressure, casting a liquid monomer in the molding cavity, polymerizing the monomer to form a rigid solid, having a first aspheric optical surface adhering to the optical surface of the mold with sufficient adhesive strength to allow cutting and polishing of a second optical surface, cutting and polishing the surface of the said rigid solid on the side opposite the first aspheric optical surface to form a second optical surface while the rigid solid is held by the mold, and then removing the thus formed aspheric lens by applying pressure against the sides of the mold to distort the shape of the optical surface of the mold to thereby release the aspheric lens from the mold.

4,188,354

METHOD FOR THE PREPARATION OF ASYMMETRICAL MEMBRANES

Stelio Munari; Fernando Vigo; Gustavo Capannelli; Claudio Uliana, and Aldo Bottino, all of Genoa, Italy, assignors to Tecneco S.p.A., Fano, Italy

Filed Jul. 29, 1977, Ser. No. 820,322

Claims priority, application Italy, Aug. 5, 1976, 12746 A/76; Oct. 27, 1976, 12862 A/76

Int. Cl.[2] B29D *27/04*

U.S. Cl. 264—22 2 Claims

1. A method for the preparation of asymmetric membranes, said method comprising the steps of:

(a) reacting polyvinylidene fluoride or polyvinyl fluoride with 20%—SO_3 oleum for a time period sufficient to sulphonate the polymer, said reaction being carried out at about 70° C. for a time period of about 30 minutes;

(b) dissolving the polymer in dimethylformamide in proportions which vary between about 4% and about 80% by weight per volume of solvent, said dissolution being carried out at about 90° C. and said proportion is between about 8% and about 20% by weight per volume of solvent;

(c) spreading the thus obtained solution to a thickness of about 10 microns to about 1,000 microns on a plate, said thickness being about 200 microns;

(d) evaporating the solvent from the solution on the plate for up to about 60 minutes at a temperature in the range of from about −20° C. to about +100° C., said evaporation being carried out for about 1 to about 8 minutes at a temperature of about 25° C.;

(e) precipitating the asymmetric membrane on the plate with a non-solvent, said asymmetric membrane having a separating power of about 10% towards sodium chloride, up to about 99% towards mineral oil and up to about 98% towards acrylonitrile-butadiene-styrene detergents, with a permeability of between about 7,000 and about 30,000 liters per square meter at a temperature of 45° C., under a pressure of 1 kilgram and with an oil concentration of 7%, said precipitation being carried out by immersing the plate in water and ice at about 0° C. for about 1 hour and then in running water for between about ½ and about 8 days.

4,188,355

MANUFACTURE OF FIBROUS WEBS

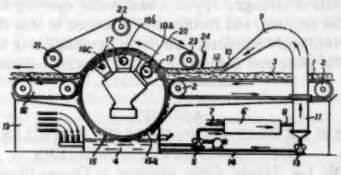
Robert Graham, Chester-le-Street, and Philip S. Hall, Langley Park, both of England, assignors to Newalls Insulation Company Limited, Manchester, England

Filed Oct. 7, 1977, Ser. No. 840,238

Claims priority, application United Kingdom, Oct. 9, 1976, 42064/76; Jun. 14, 1977, 24835/77

Int. Cl.[2] B29D *27/04;* D04H *1/68;* H05B *9/04*

U.S. Cl. 264—26 10 Claims



1. A process for the production of a bonded, foraminous non-woven mineral fiber mat, said process comprising the following steps, in combination:

forming a non-woven mineral fiber mat by a melt spinning process,

forming a binder foam from thermosettable binder composition in an aqueous medium,

applying a layer of said binder foam to one face of said mat, forcing said layer into said mat, such that the binder foam is

caused to collapse so as to thoroughly impregnate the entire mat with said collapsed binder foam,

selectively removing by radio frequency heating a major portion of the aqueous medium from the impregnated mat, and thereafter

causing the binder to set in situ in the mat.

4,188,356

METHOD AND AN APPARATUS FOR THE PRODUCTION OF A FOAM-FORMING REACTION MIXTURE OR HOMOGENEOUS MATERIAL-FORMING REACTION MIXTURE AND FOR THE SUBSEQUENT INTRODUCTION THEREOF INTO A CAVITY

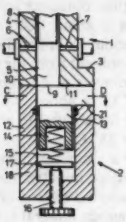
Gerd Weber, Leverkusen; Dieter Skoupi, Linde, and Hermann Schäfer, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 9, 1978, Ser. No. 932,252

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1977, 2737616

Int. Cl.[2] **B29D** *27/00*

U.S. Cl. 264—40.1 **9 Claims**



1. In a method of producing a foam-forming or homogeneous material-forming reaction mixture from at least two liquid reactants and subsequently introducing it into a cavity, wherein the reactants are introduced into a mixing zone where they are mixed together, and wherein the mixture is subsequently fed through an outlet of regulated cross-section and charged into a cavity, the improvement wherein the outlet of the mixing zone is sealed before the reactants begin to be introduced into the mixing zone and is only opened at a predetermined pressure by the pressure building up therein as the reactants are introduced and wherein the outlet cross-section is automatically adjusted in response to said pressure buildup and remains adjustable throughout the delivery process.

3. An apparatus for mixing reacting materials, consisting of a mixing chamber arranged in a housing and having inlet openings for the reactants and an outlet opening for the reaction mixture to be introduced into a mold wherein an adjustable baffle plate is arranged opposite said outlet opening axially of the outlet opening, and further characterized in that the baffle plate is resiliently mounted, said outlet opening being sealed by said baffle plate and before the mixing process begins.

4,188,357

METHOD OF PREPARING HOLLOW ARTICLES FROM THERMOPLASTIC POLYESTERS

Santos W. Go, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 16, 1977, Ser. No. 861,141

Int. Cl.[2] **B29C** *5/06*

U.S. Cl. 264—540 **2 Claims**

1. In the method of forming hollow articles from a polyester made from terephtalic acid or its lower esters and one or more dioles by making a hollow preform and enclosing said preform in a softened temperature condition in a blow mold and thereafter blow molding said preform into conformance with said mold walls, the improvement comprising forming said hollow preform as a tubular shape by free extrusion of a thermoplastic copolyester consisting essentially of the polymeric reaction of

(A) reactant(s) selected from terephthalic acid and its C_1 to C_4 alkyl esters, and

(B) reactants, bis(4-beta-hydroxyethoxyphenyl) sulfone and ethylene glycol, and

(C) reactant(s) selected from trimellitic acid, its anhydride, and its C_1 to C_4 alkyl esters, wherein the amount of said bis(4-beta-hydroxyethoxyphenyl) sulfone is 2–25 mol percent of the amount of A reactant(s), the combined amount of B reactants is about 110 to 300 mol percent of the amount of A reactant(s), and the amount of C reactant(s) is 0.1 to 0.7 mol percent of said A reactants,

said copolyester having oxygen (O_2) and CO_2 permeabilities in cc-mil/100 in.^{2}-day-atm. of less than 9 and less than 62, respectively, a glass transition temperature, Tg, of at least 82° on an unoriented basis, said copolyester further having non-Newtonian flow properties.

4,188,358

METHOD OF MANUFACTURING A METALLIZED PLASTIC REFLECTOR

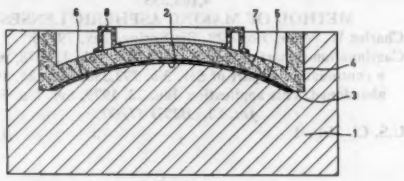
Wilhelmus H. C. Withoos; Gerhardus A. te Raa, and Johannes Sprengers, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 14, 1977, Ser. No. 777,036

Claims priority, application Netherlands, Mar. 29, 1979, 7603245

Int. Cl.[2] **B22D** *23/08;* **B29C** *24/00, 25/00*

U.S. Cl. 264—255 **6 Claims**



1. A method for fabricating an antenna reflector comprising the steps of coating a surface of a mold with a first layer of fibrous material, saturating said first layer with a thermo-hardening synthetic resin, partially hardening said resin and while said resin is still only partially hardened and has a slightly sticky surface, coating said sticky surface with a metal layer by flame spraying to form a reflector for electromagnetic radiation and applying a supporting layer onto said metal layer.

4,188,359

THIOETHER CONTAINING QUARTENARY AMMONIUM DERIVATIVES OF 1,4-THIAZINES

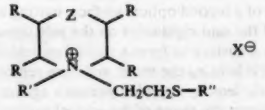
Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 886,182, Mar. 13, 1978, Pat. No. 4,146,709. This application Dec. 4, 1978, Ser. No. 966,250

Int. Cl.[2] **C23F** *11/04*

U.S. Cl. 422—12 **5 Claims**

1. A process inhibiting corrosion which comprises treating a system with a composition characterized by the formula



where R is hydrogen, or a hydrocarbon group, R′ is a hydro-

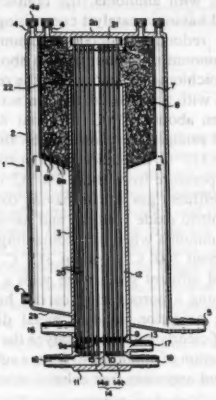
carbon group, R'' is a hydrocarbon group, Z is S, SO, or SO_2 and X is an anion.

4,188,360

ARTIFICIAL LUNG WITH A BUILT-IN HEAT EXCHANGER

Motoji Kurata, Hiroshima, Japan, assignor to Japan Medical Supply Co., Ltd., Hiroshima, Japan

Filed Sep. 8, 1978, Ser. No. 940,737
Int. Cl.[2] A61M 1/03
U.S. Cl. 422—46 4 Claims



1. An artificial lung provided with a built-in heat exchanger comprising an outer cylindrical member having top and bottom walls and an outlet for blood formed in a lower portion thereof;

an inner cylindrical member disposed within said outer cylindrical member with a lower portion thereof extending through the bottom wall of said outer cylindrical member, the lower portion of said cylindrical member having an oxygen dispenser plate, an intermediate plate and a bottom plate formed therein defining an oxygen inlet chamber and a heat-exchange medium chamber therebetween, respectively, the heat-exchange medium chamber having a partition wall formed therein to divide the same into a heat exchange medium inlet chamber and a heat exchange medium outlet chamber, the lower portion of said inner cylindrical member also having an inlet for blood formed therein, an inlet for oxygen connected to said oxygen inlet chamber, and an inlet and outlet for heat exchange medium connected to said heat exchange medium inlet chamber and said heat exchange medium outlet chamber, resectively, an intermediate cylindrical member disposed between said outer and inner cylindrical members, said intermediate cylindrical member including a bottom wall having spacings formed therein defining a defoaming chamber between said inner and intermediate cylindrical members; and

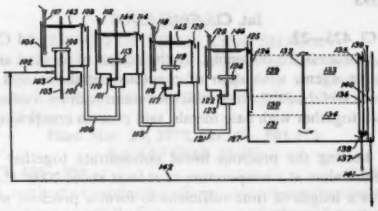
a plurality of tubes disposed within said inner cylindrical member through which heat exchange medium is passed, said plurality of tubes passing through said oxygen inlet chamber and said heat exchange medium chamber, wherein oxygen supplied to said inlet chamber through said oxygen inlet and blood supplied to said inner chamber through said blood inlet are in contact with said heat exchange medium carrying tubes prior to being brought into contact with one another.

4,188,361

RECOVERY OF URANIUM VALUES

George A. Rowden, Stockton-on-Tees, England, assignor to Davy International (Oil and Chemicals) Limited, England

Filed Apr. 12, 1978, Ser. No. 895,721
Int. Cl.[2] B01D 11/04
U.S. Cl. 423—9 10 Claims



1. A process for the recovery of uranium values from a uranium-loaded organic extractant phase containing an amine capable of forming a uranium-containing complex soluble in the organic extractant phase, which process comprises contacting the extractant phase in a plurality of mixing stages with an acidic aqueous stripping phase containing sulphate ions dissolved therein, the plurality of mixing stages including a first mixing stage and a final mixing stage, passing the phases in co-current through the mixing stages in turn from one mixing stage to the next, agitating the phases in each mixing stage so as to maintain therein a dispersion of droplets of one phase dispersed in the other, the droplets being of a size such that upon standing the dispersion disengages substantially completely under gravity into two separate layers, passing dispersion from the final mixing stage to a final settling stage to permit disengagement of the phases, maintaining the pH in the first mixing stage at a first predetermined value permitting stripping of uranium values from the extractant phase, maintaining the pH in the, or in at least one, subsequent mixing stage at a value greater than the first predetermined value but less than that at which precipitation of uranium values occurs, and recovering disengaged phases from the final settling stage.

8. Apparatus for effecting recovery of uranium values from a uranium-loaded organic extractant phase containing an amine capable of forming a uranium-containing complex soluble in the organic extractant phase, which apparatus comprises a first mixing chamber, a final mixing chamber, a final settling chamber for receipt of dispersion from the final mixing chamber, means for feeding to the first mixing chamber the extractant phase and an acidic aqueous stripping phase containing sulphate ions dissolved therein, means connecting the mixing chambers in series whereby the phases may flow in co-current through the mixing chambers in turn, mixing means in each mixing chamber for agitating the phases so as to maintain therein a dispersion of droplets of one phase dispersed in the other, the droplets being of a size such that the dispersion settles upon standing under gravity substantially completely into two separate layers, means for controlling the pH in the mixing chambers so as to permit maintenance in the first mixing chamber of a pH having a first predetermined value permitting recovery of uranium values from the organic extractant phase by the aqueous stripping phase and in the, or in at least one, subsequent mixing chamber of a pH greater than the first predetermined value but less than that at which precipitation of uranium values occurs, and means for recovering disengaged phases from the final settling chamber.

4,188,362

PROCESS FOR THE TREATMENT OF PLATINUM GROUP METALS AND GOLD

Roderick I. Edwards, Honeydew; Joe P. Loo, Sandton, and David I. Ossin, Johannesburg, all of South Africa, assignors to National Institute for Metallurgy, Randburg, South Africa

Continuation-in-part of Ser. No. 825,151, Aug. 16, 1977, abandoned, which is a continuation of Ser. No. 652,283, Jan. 26, 1976, abandoned. This application Jun. 28, 1978, Ser. No. 919,837

Claims priority, application South Africa, Jan. 29, 1975, 75/0593

Int. Cl.[2] C01G *55/00*

U.S. Cl. 423—22 14 Claims

1. A process for obtaining, by the action of an acid and an oxidizing agent, a solution of precious metals present in a precious metal concentrate which contains iridium, ruthenium or both together with base metals, said process comprising the steps of:

(1) heating the precious metal concentrate together with aluminium at a temperature of at least about 1000° C., and for a length of time sufficient to form a precious metal-/aluminium alloy,

(2) leaching the alloy with acid under conditions other than strongly oxidizing conditions to dissolve the base metals yielding a residue containing the major portion of the precious metals therein,

(3) separating the residue from the leach liquor, and thereafter,

(4) leaching the residue under strong oxidizing conditions with acid and an oxidant to dissolve at least a major portion of the iridium and ruthenium together with any other precious metals present in said residue.

3. A process as claimed in claim 1 in which the leach for the removal of the majority of the base metals in step (2) is hydrochloric or sulphuric acid.

4. A process as claimed in claim 3 in which the acid is contained in a recycle stream together with small amounts of precious metals which are cemented out during the leaching procedure of step (2).

4,188,363

RECOVERY OF RHODIUM COMPLEX CATALYSTS HOMOGENEOUSLY DISSOLVED IN ORGANIC MEDIA

Bernard Fell, Aachen, and Wilfried Dolkemeyer, Bornheim Uedorf, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 823,231, Aug. 9, 1977, abandoned. This application Oct. 20, 1978, Ser. No. 953,339

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1976, 2637262

Int. Cl.[2] C01G *55/00*

U.S. Cl. 423—22 9 Claims

1. A process for the separation of rhodium catalysts, having as ligands on the central rhodium atom a phosphine or phosphite which contains aliphatic and/or aromatic hydrocarbon radicals, from high-boiling and tarry distillation residues obtained in the processing of reaction products from organic catalytic reactions utilizing dissolved homogenous rhodium complex catalysts, which consists of passing a stream of hydrogen or a hydrogen-containing gas through the residue at an elevated temperature of between 100°–660° C. to thereby selectively remove the organic constituents, leaving a heterogeneous solid residue containing the rhodium, and thereafter dissolving the heterogenous residue in an inorganic acid selected from the group consisting of hydrochloric acid, hydrobromic acid, nitric acid, sulphuric acid and oleum to thereby form a water-soluble rhodium compound suitable for the production of a complex rhodium catalyst.

4,188,364

TWO-STAGE CATALYSIS OF ENGINE EXHAUST

John R. Gladden, Metamora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 802,205, May 31, 1977, abandoned. This application Jul. 13, 1978, Ser. No. 924,420

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—213.2 3 Claims

1. A method of removing nitric oxide from a hydrocarbon burning engine exhaust stream, the engine operating under varying load conditions from a high load to a low load wherein the exhaust stream temperature varies from a high of about 800° C. to a low of about 200° C., comprising:

contacting a combusted gas stream comprising nitric oxide and oxygen with ammonia, the contacting over a first catalyst bed having a catalyst comprising a zeolite which catalyzes a reductive reaction of ammonia with nitric oxide, the amount of ammonia from about 0.5 to about 2 times the stoichiometric amount for the reductive reaction of ammonia with nitric oxide, the contacting at a temperature between about 200° C. to about 800° C., the first catalyst bed retaining ammonia when the temperature is above about 315° C. and desorbing a portion of the ammonia at a temperature from about 200° C. to about 315° C., to form an effluent gas stream having oxygen, a reduced amount of nitric oxide content, and having the desorbed portion of ammonia when said contacting is at a temperature from about 200° C. to about 315° C.; and

contacting said effluent gas stream with a second catalyst bed comprising a porous solid carrier having a catalytically active oxidation catalyst metal disposed thereon which is sufficiently active to catalyze the oxidation of the desorbed portion of ammonia to form a substantially nitric oxide free and ammonia free exhaust stream.

4,188,365

PROCESS FOR CATALYTIC VAPOR PHASE REDUCTION OF NITROGEN OXIDES AND CATALYST COMPOSITION USED THEREFOR

Toshihiro Yoshioka; Shikiho Itaya, both of Ohtake; Yusaku Arima, Onga, and Hirokazu Tanaka, Kitakyushu, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan and Catalysts & Chemical Industries, Tokyo, Japan

Division of Ser. No. 786,825, Apr. 12, 1977, Pat. No. 4,140,654. This application Jan. 12, 1978, Ser. No. 868,929

Claims priority, application Japan, Apr. 16, 1976, 51-42576; Nov. 27, 1976, 51-141777

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—239 A 9 Claims

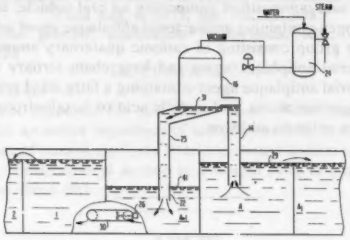
1. A process for the catalytic vapor phase reduction of nitrogen oxides in a waste gas, which comprises contacting the waste gas containing nitrogen oxides with a catalyst composition in the presence of ammonia gas at a temperature of 200° to 600° C., said catalyst composition consisting essentially of a non-noble transition metal compound supported on a shaped carrier comprising a titanium oxide and a clay mineral having an average particle size of 0.1 to 100 microns and an additional component which is an inorganic fibrous material or a mixture of the fibrous material and at least one member selected from the group consisting of silica hydrogel and silica sol, wherein the clay mineral is selected from the group consisting of montmorillonite clay minerals, kaolin clay minerals, silica halloysite clay minerals, pyrophyllite clay minerals and sericite clay minerals and the catalyst composition contains 0.1 to 20% by weight of the non-noble transition metal compound, 1 to 60% by weight of the clay mineral and 20 to 90% by weight of titanium oxide, all based on the weight of the catalyst composition, and 0.5 to 25% by weight of the additional component based on the total weight of the titanium oxide and clay mineral.

4,188,366

MANUFACTURE OF PHOSPHORIC ACID

Samuel V. Houghtaling, Lakeland, Fla., assignor to Société de Prayon, Foret-Trooz, Belgium

Filed Nov. 18, 1977, Ser. No. 852,613
Int. Cl.[2] C01B *25/22*; C01F *11/46*
U.S. Cl. 423—320 15 Claims



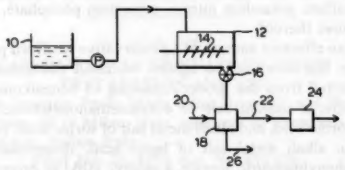
1. In a process for the manufacture of phosphoric acid from phosphate rock and sulfuric acid by the wet process in which there is an aqueous slurry reaction mixture containing phosphoric acid and undissolved calcium sulfate solids at substantially atmospheric pressure, and in which said reaction mixture is passed to a vacuum flash cooling zone for removing heat from the reaction system, the improvement comprising conducting said process with a level of liquid slurry in a first reaction zone of said reaction system, a level of liquid slurry in a second reaction zone of said reaction system which level is substantially below said liquid level in said first zone, a barometric column of liquid slurry extending from said first zone to said vacuum flash cooling zone which is substantially above said liquid level in said first zone, and a barometric column of liquid slurry between said vacuum flash cooling zone and said liquid slurry in said second zone, passing said reaction slurry without pumping from said first zone, through the vacuum flash cooling zone to said second zone at a rate of at least about 500% per hour of the total mixture in the reaction system to remove heat from said slurry, and maintaining said flow rate through said vacuum flash cooling zone and the level differential between said first and second zones of said reaction system at values at which the temperature differential of the reaction mixture passing into and out of said flash cooling zone is only up to about 6° F.

4,188,367

MANUFACTURE OF RED PHOSPHORUS

James D. McGilvery, Etobicoke, Canada, assignor to Erco Industries Limited, Islington, Canada

Filed Jan. 31, 1978, Ser. No. 873,870
Claims priority, application United Kingdom, Feb. 7, 1977, 4895/77
Int. Cl.[2] C01B *25/023*
U.S. Cl. 423—322 4 Claims



1. A continuous process for the production of red phosphorus, which comprises continuously injecting liquid white phosphorus onto a continuously agitated bed of red phosphorus particles located in a closed reaction vessel, continuously controlling the temperature of said particle bed within the range of about 300° to about 595° C. at least in part by controlling the rate of said continuous injection feed so that the concentration of white phosphorus in the bed is less than about 20% by weight, removing red phosphorus particles from said reaction vessel on an intermittent or continuous basis to control the quantity of phosphorus in said reaction vessel, and separating residual unreacted white phosphorus from said removed red phosphorus particles.

4,188,368

METHOD OF PRODUCING SILICON

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Charles B. Wolf, Irwin, and Thomas N. Meyer, Murrysville, both of Pa.

Filed Mar. 29, 1978, Ser. No. 891,373
Int. Cl.[2] C01B *33/02*
U.S. Cl. 423—350 7 Claims

1. A method of producing silicon comprising the steps of:
establishing an axially flowing stream of a heated carrier gas containing a dispersion of partially or completely vaporized reductant for $SiCl_4$ selected from sodium, magnesium or zinc upstream of the point of injection of $SiCl_4$, said carrier gas dispersion being at a temperature above the melting point of silicon;
injecting $SiCl_4$ as liquid spray transversely into the axially flowing dispersion stream from a plurality of radially directed nozzles, equally spaced around the periphery of the stream and each nozzle being sealingly mounted in a port in a wall portion surrounding said stream with the outlet tip of each nozzle being recessed at least 1 cm from the inner wall surface whereby said $SiCl_4$ liquid vaporizes within the stream;
reducing the vaporized $SiCl_4$ with the reductant within the axial stream to form liquid silicon;
depositing the liquid silicon downstream of the point of injection on a surface of a wall surrounding the axial stream and extending downstream of said point of injection;
flowing the liquid silicon down the surface of said wall; and
collecting and recovering the liquid silicon.

4,188,369

METHOD OF MANUFACTURING VITREOUS CARBON

Jorma K. Rautavuori, Laulurastaantia 7, 36220 Suorama, and Pertti Törmälä, Viertolankatu 38,, 33750 Tampere, both of Finland

Filed Feb. 21, 1978, Ser. No. 879,701
Claims priority, application Finland, Feb. 21, 1977, 770554
Int. Cl.[2] C01B *31/02*
U.S. Cl. 423—449 12 Claims

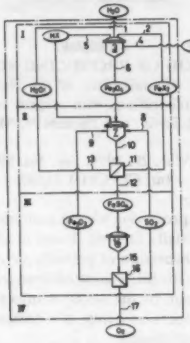
1. A method of manufacturing a vitreous carbon body comprising the steps of
(a) providing a mixture of a thermosetting resin and an inert organic solvent;
(b) hardening the resin in the presence of the solvent while maintaining the temperature of the mixture below the boiling point of the solvent to produce a hardened resin body containing substantially all of said solvent dispersed therein;
(c) raising the temperature of the hardened resin body above the boiling point of the solvent to remove the solvent therefrom and to develop porosity in said hardened resin body; and
(d) carbonizing the porous hardened resin body in an inert atmosphere to form a vitreous carbon body.

4,188,370

THERMOCHEMICAL METHOD FOR PRODUCING HYDROGEN FROM WATER

Kinjiro Fujii, Komae; Wakichi Kondo, Isehara, and Toshiya Kumagai, Tokyo, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Jun. 8, 1978, Ser. No. 913,746
Claims priority, application Japan, Jun. 10, 1977, 52/68681
Int. Cl.[2] C01B *1/05, 13/02*
U.S. Cl. 423—579 **14 Claims**



1. A thermochemical method of producing hydrogen comprising:

(1) reacting ferrous halide and water to produce triiron tetraoxide, hydrogen halide and hydrogen;

(2) reacting the triiron tetraoxide produced in step (1) with ferric oxide, sulfur dioxide and hydrogen halide to produce ferrous halide, ferrous sulfate and water;

(3) thermally decomposing the ferrous sulfate produced in (2) to ferric oxide, sulfur dioxide and oxygen; and

(4)(a) recovering the hydrogen produced in said step (1),

(b) delivering the hydrogen halide produced in step (1) to step (2) and

(c) recycling the ferrous halide produced in step (2) to step (1), and ferric oxide and sulfur dioxide produced in step (3) to step (2).

4,188,371

IMMUNOLOGICAL DETECTION OF NEISSERIA BACTERIA VIA LABELLED ANTIBODIES

Howard H. Weetall, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Sep. 28, 1977, Ser. No. 837,362
Int. Cl.[2] G01N *33/16;* **A61K** *43/00*
U.S. Cl. 424—1 **20 Claims**

1. A method for detecting Neisseria bacteria in a sample via an immunoradiometric assay technique comprising the steps:

(a) preparing a lysate of the sample to be tested;

(b) bringing radiolabelled antiserum specific to 1,2-propanediol dehydrogenase into contact with the lysate obtained in step (a);

(c) incubating the mixture resulting from step (b);

(d) bringing a solid phase antigen or antigen immunoadsorbent into contact with the incubated mixture of step (c);

(e) incubating the mixture resulting from step (d); and

(f) monitoring the radioactivity of the supernatant.

4,188,372

ANTIBACTERIAL ORAL COMPOSITION

Abdul Gaffar, Somerset, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 754,651, Dec. 27, 1976, abandoned. This application Aug. 31, 1978, Ser. No. 938,678
Int. Cl.[2] A61K *7/16, 7/18, 7/22, 7/24*
U.S. Cl. 424—54 **16 Claims**

1. An oral composition comprising an oral vehicle, at least one nitrogen-containing antibacterial antiplaque agent selected from the group consisting of cationic quaternary ammonium antibacterial antiplaque agent and long chain tertiary amine antibacterial antiplaque agent containing a fatty alkyl group of 12 to 18 carbon atoms, and mellitic acid or hexahydromellitic acid as an antistain additive.

4,188,373

CLEAR, WATER-MISCIBLE, LIQUID PHARMACEUTICAL VEHICLES AND COMPOSITIONS WHICH GEL AT BODY TEMPERATURE FOR DRUG DELIVERY TO MUCOUS MEMBRANES

Joseph Z. Krezanoski, Los Altos, Calif., assignor to Cooper Laboratories, Inc., Palo Alto, Calif.

Continuation of Ser. No. 661,612, Feb. 26, 1976, Pat. No. 4,100,271. This application Nov. 18, 1977, Ser. No. 852,745
The portion of the term of this patent subsequent to Jul. 11, 1995, has been disclaimed.
Int. Cl.[2] A61K *31/74*
U.S. Cl. 424—78 **4 Claims**

1. A pharmaceutical composition for medicinally treating a mucous membrane or eye condition requiring pharmacologic treatment, comprising:

(a) a pharmacologically effective amount of a chemical material which is pharmacologically active against said condition; said material being selected from the group consisting of dexamethasone, pilocarpine HCl, phenylephrine HCl, clofazimine, pimaricin, amphotericin, neomycin sulfate, chloramphenicol, bacitracin, sulfacetamide, gentamycin, and polymixin B sulfate;

(b) from about 10% to about 26% by weight of a polyoxyethylene-polyoxypropylene block copolymer in which the number of polyoxyethylene units is at least about 50% of the total number of monomeric units in the total molecule, the block copolymer having an average molecular weight of from about 7,500 to about 15,500, a room temperature solubility in water of greater than about 10 grams per 100 ml. of water, and a cloud point in 1% aqueous solution of at least about 100° C.;

(c) up to about 10% sodium chloride equivalent of at least one water-soluble compatible salt selected from the group consisting of sodium halide, sodium sulfate, sodium nitrate, sodium phosphate, potassium halide, potassium sulfate, potassium nitrate, potassium phosphate, and mixtures thereof;

(d) an effective amount of a preservative to afford protection to the composition against bacterial contamination selected from the group consisting of benzalkonium chloride, a sodium salt of ethylenediaminetetraacetic acid, sorbic acid, and alkali metal salt of sorbic acid, boric acid, an alkali metal salt of boric acid, thimerosal sodium, phenylmercuric acetate, a methyl, ethyl or propyl ester of para-aminobenzoic acid, and mixtures thereof; and

(e) from about 74% to about 90% by weight water;

the composition having a pH of from about 6.0 to about 8.5 and a gel transition temperature in the range of from about 25° C. to about 40° C.

4,188,374

ATTRACTANT FOR THE POTATO MOTH AND THE PREPARATION OF THE FORMER

Simon Voerman, Wageningen; Cornelis J. Persoons, Delfgauw, and Fridolin J. Ritter, Waddinxveen, all of Netherlands, assignors to Nederlandse Organisatie Voor Toegepast-Natuurwetenschappe-Lijk Onderzoek Ten Behoeve Van Nijverheid, Handel En-Verkeer, The Hague, Netherlands

Filed Aug. 4, 1977, Ser. No. 821,954

Claims priority, application Netherlands, Aug. 6, 1976, 7608732

Int. Cl.[2] A01N *17/14*

U.S. Cl. 424—84 6 Claims

1. An attractant for the potato moth (*Phthorimaea operculella*), an active ingredient of which essentially consists of a mixture of trans-4, cis-7, cis-10-tridecatrienyl acetate and trans-4, cis-7-tridecadienyl acetate in a weight ratio of from about 1:10 to about 10:1.

4,188,375

PROCESS FOR THE PREPARATION OF VACCINES

Otto C. Straub, Tuebingen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 23, 1977, Ser. No. 835,923

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1976, 2643213

Int. Cl.[2] A61K *39/02, 39/12;* C25F *5/00*

U.S. Cl. 424—88 10 Claims

1. A process for the preparation of a vaccine which comprises subjecting, at a temperature of from 4° to 60° C. a suspension of the micro-organism to an alternating electrical current having a voltage of from 110 to 330 V and a strength of from 200 to 300 mA, and incorporating the resulting inactivated or attenuated micro-organism into a vaccine preparation.

4,188,376

STABLE LIQUID COMPOSITIONS CONTAINING SALTS OF 1,2-BENZISOTHIAZOLIN-3-ONE

David T. Payne, and Boris P. Brand, both of Manchester, England, assignors to Imperial Chemical Industries Limited, Great Britain

Filed Sep. 15, 1978, Ser. No. 942,811

Claims priority, application United Kingdom, Sep. 30, 1977, 40776/77

Int. Cl.[2] A61K *31/00;* A01N *9/12, 9/20*

U.S. Cl. 424—173 7 Claims

1. A biocidal composition for the protection of aqueous media against infection by microorganisms comprising a solution containing from 5% to 50% by weight of an alkali metal salt of 1,2-benzisothiazolin-3-one in a hydroxylic organic solvent selected from the group consisting of dipropylene glycol, tripropylene glycol, polyethylene glycol, of molecular weight 300, lower alkyl carbitols and mixtures of at least one of these solvents and a solvent selected from the group consisting of propylene glycol and water said solvent being present in an amount to prevent crystallization or solidification on prolonged exposure to temperatures as low as −10° C.

4,188,377

CARMINOMYCIN DERIVATIVES, THEIR PREPARATION AND USE

Antonino Suarato; Paolo Masi; Luigi Bernardi, and Federico Arcamone, all of Milan, Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

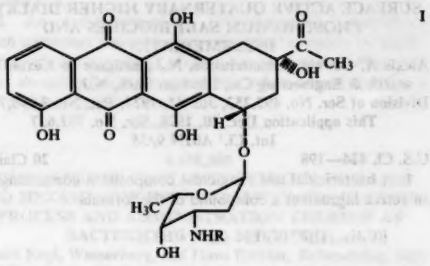
Filed Jan. 26, 1978, Ser. No. 872,626

Claims priority, application United Kingdom, Feb. 1, 1977, 04104/77

Int. Cl.[2] A61K *31/70;* C07H *15/24*

U.S. Cl. 424—180 4 Claims

1. An N-acyl derivative of carminomycin having the formula:



I

wherein R is an acyl group selected from the group consisting of acetyl, mono, di and trichloroacetyl, trifluoroacetyl and benzoyl.

3. A method of treating a host afflicted with transplanted P_{388} lymphocytic leukemia which comprises intraperitoneally administering to a host afflicted with said tumor a therapeutically effective amount of an N-acyl derivative according to claim 1.

4,188,378

ANTICANCER AND ANTIVIRAL ACTIVITY OF 9-β-D-ARABINOFURANOSYL-2-FLUOROADENINE

John A. Montgomery, Birmingham, Ala., assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Jan. 4, 1978, Ser. No. 866,907

Int. Cl.[2] A61K *31/70*

U.S. Cl. 424—180 6 Claims

1. A method of treating murine leukemias L1210 and P388 by medicating orally or intraperitoneally leukemic mice with 9-β-D-arabinofuranosyl-2-fluoroadenine, a metabolically stable drug, given over a treatment span of 1–10 days with dosage repeated 2–8 times per diem.

4,188,379

STEROLINS AND THEIR USE

Karl H. Pegel, Durban Natal, South Africa, assignor to Roecar Holdings (Netherlands Antilles) N.V., Curacao, Netherlands Antilles

Filed Oct. 19, 1977, Ser. No. 843,496

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1976, 2659466

Int. Cl.[2] A61K *31/705;* C07J *17/00*

U.S. Cl. 424—182 54 Claims

1. A composition suitable for administration as an anti-inflammatory, gout-combatting or prostate hypertrophy combatting agent comprising a sterol glycoside or ester thereof together with a pharmaceutically acceptable carrier in dosage form, said dosage containing 0.1 to 0.75 mg of said sterol, said sterol being tall oil sterols glucosides, sitosterol glucoside, ergosterol glucoside, lanosterol glucoside, 24,25-dihydrolanosterol glucoside, stigmasterol glucoside, soya sterol glucosides, sitosterol-β-D-galactoside, sitosterol-β-D-maltoside, sitosterol-β-D-lactoside or sitosterol-β-D-cellobioside.

4,188,380

SURFACE ACTIVE QUATERNARY HIGHER DIALKYL PHOSPHONIUM SALT BIOCIDES AND INTERMEDIATES

Alexis A. Oswald, Mountainside, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 493,253, Jul. 31, 1974, Pat. No. 3,998,754. This application Dec. 20, 1976, Ser. No. 752,627

Int. Cl.[2] A01N 9/36

U.S. Cl. 424—198 20 Claims

1. A bactericidal and fungicidal composition comprising as an active ingredient a compound of the formula:

$$[(C_rH_{2r+1})_2P^+(C_sH_{2s+1})_2]X^-\bullet(HX)_x$$

wherein r is 8 to 30, s is 1 to 4 and X is an anion selected from the group consisting of halide, phosphate, sulfate, sulfonate, tetrafluoroborate, nitrate and nitrite; x is 0 or 1 except that if r is 12 to 14 and s is 1, X cannot be 0, in an amount sufficient to provide said bactericidal and fungicidal properties and an inert carrier therefor.

4,188,381

FUNGICIDES HYDRAZINIUM PHOSPHITES

Jacques Ducret, Lyons; Jean-Michel Gaulliard, Orlienas, and Jean Vial, Dardilly, all of France, assignors to Philagro, France

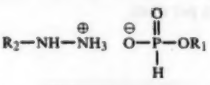
Filed Jan. 26, 1978, Ser. No. 872,435

Claims priority, application France, Feb. 14, 1977, 77 04981

Int. Cl.[2] A01N 9/36

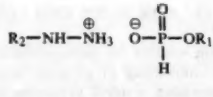
U.S. Cl. 424—199 12 Claims

1. A process for the treatment of crops against fungal diseases, which comprises applying to a crop a fungicidal composition containing as active material at least one compound of the formula



in which R_1 represents a hydrogen atom, or an alkyl radical containing from 1 to 4 carbon atoms, and R_2 represents a hydrogen atom, or a phenyl nucleus which is optionally substituted by one or more of the following atoms or radicals: halogen, alkyl radicals containing from 1 to 4 carbon atoms, and the nitro radical, provided that R_1 and R_2 do not simultaneously represent a hydrogen atom at a dose of between 10 g/hl and 300 g/hl.

4. A derivative of hydrazinium phosphite, of the formula:



in which R_1 represents a hydrogen atom, or an alkyl radical containing from 1 to 4 carbon atoms, and R_2 represents a hydrogen atom, or a phenyl nucleus which is optionally substituted by one or more of the following atoms or radicals: halogen, alkyl radicals containing from 1 to 4 carbon atoms, and the nitro radical, provided that R_1 and R_2 do not simultaneously represent a hydrogen atom.

4,188,382

THIAZOLINYL (THIAZOLYL) PHOSPHONAMIDATES AND PHOSPHORAMIDATES PESTICIDAL AND HERBICIDAL COMPOSITIONS BASED THEREON

Nikolai N. Melnikov; Artur F. Grapov; Ljudmila V. Razvodovskaya; Petr V. Popov; Aelita S. Sedykh; Galina K. Shapovalova; Galina M. Abelentseva; Tamara A. Siforova; Tatyana A. Nikolaeva; Valentina V. Galitsina; Leonid D. Stonov, and Ljudmila A. Bakumenko, all of Moscow, U.S.S.R., assignors to Vsesojuzny Nauchno, et al., Moscow, U.S.S.R.

Filed Feb. 25, 1977, Ser. No. 772,276

Int. Cl.[2] C07F 9/65; A01N 9/36

U.S. Cl. 424—200 5 Claims

1. O-phenyl-N-thiazolinyl-2-methylphosphonamidate.

2. O-phenyl-N-thiazolinyl-2-methylphosphonamidothioate.

3. A composition according to claim 1, containing as an active principle O-phenyl-N-thiazolinyl-2-methylphosphonamidate.

4,188,383

COMBATING ARTHROPODS WITH O-ALKYL-O-(6-DIALKYL-CARBAMOYLOXY-PYRIMIDIN-4-YL)-(THIONO)(THIOL)-PHOSPHORIC (PHOSPHONIC) ACID ESTERS AND ESTER-AMIDES

Fritz Maurer, Wuppertal, and Ingeborg Hammann, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

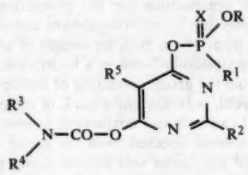
Filed Feb. 21, 1978, Ser. No. 879,423

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1977, 2709908

Int. Cl.[2] A01N 9/36; C07F 9/65

U.S. Cl. 424—200 10 Claims

1. An O-alkyl-O-(6-dialkylcarbamoyloxy-pyrimidin-4-yl)-(thiono)(thiol)-phosphoric(phosphonic) acid ester or ester-amide of the formula



in which

R is alkyl with 1 to 6 carbon atoms,

R^1 is alkyl or alkoxy with 1 to 5 carbon atoms, alkylthio or alkylamino with 1 to 6 carbon atoms, or phenyl,

R^2 is hydrogen, alkyl or alkoxy with 1 to 6 carbon atoms, alkylthio or alkylamino with 1 to 5 carbon atoms, or phenyl,

R^3 and R^4 each independently is alkyl with 1 to 4 carbon atoms,

R^5 is hydrogen, methyl or halogen, and

X is oxygen or sulphur.

9. A method of combating arthropods, which comprises applying to the arthropods or to a habitat thereof, an arthropodically effective amount of a compound according to claim 1.

4,188,384

NITROGEN-CONTAINING POLYSACCHARIDE FOR PROMOTING DRUG-SENSITIVITY OF BACTERIA RESISTANT TO ANTIBIOTICS

Chikao Yoshikumi, Kunitachi; Yoshio Omura, Tanashi, and Tetsuya Hotta, Hoya, all of Japan, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Apr. 13, 1978, Ser. No. 896,209
Claims priority, application Japan, Apr. 13, 1977, 52-41513
Int. Cl.[2] A61K *31/70, 31/71*
U.S. Cl. 424—180 3 Claims

1. A method for treating a bacterial infection induced by an antibiotic resistant strain of bacteria, said process comprising administering to a host in need of such treatment an effective amount of an antibiotic in combination with a nitrogen-containing polysaccharide obtainable by extracting mycelia of basidiomycetes belonging to the genus Coriolus of Polyporaceae with an aqueous solvent, said polysaccharide having a molecular weight of from 5,000 to 300,000 as determined by ultracentrifugation, containing 42.0 to 46.0% carbon, 5.3 to 7.0% hydrogen and 0.5 and 8.0% nitrogen, having a specific rotatory power of 0° to +50.0°, having good solubility in water but being insoluble in acetone, pyridine, chloroform and hexane, showing characteristic absorption at 840 cm^{-1} and 890 cm^{-1} in the infrared spectrum and having a ratio of saccharide portion to protein portion of from 62/38 to 97/3 as indicated by nuclear magnetic resonance spectroscopy, said antibiotic being capable of combatting said antibiotic resistant strain when administered with said nitrogen-containing polysaccharide.

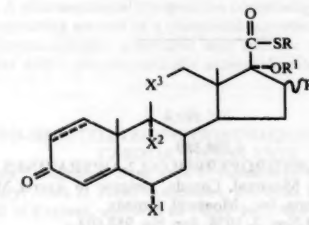
4,188,385

THIOETIANIC ACID DERIVATIVES

John A. Edwards, Los Altos, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Apr. 5, 1978, Ser. No. 893,388
Int. Cl.[2] A61K *31/58;* C07J *71/00*
U.S. Cl. 424—241 41 Claims

1. A compound chosen from those represented by the formula



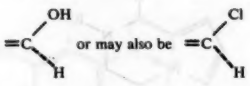
(I)

wherein

X^1 is hydrogen, fluoro or chloro;

X^2 is hydrogen, fluoro, chloro or bromo;

X^3 is =C=O or



when X^2 is chloro;

R is alkyl of 1 through 6 carbon atoms or is phenyl or benzyl optionally substituted with one substituent on the phenyl ring chosen from the group consisting of alkyl of 1 through 4 carbon atoms, alkoxy of 1 through 4 carbon atoms and halo;

R^1 is hydrogen or alkanoyl of 2 through 6 carbon atom when R^2 is hydrogen, alpha-methyl or beta-methyl;

OR^1 and R^2 together are 16 alpha, 17 alpha-isopropylidenedioxy; and there is a double or a single bond between C-1 and C-2.

22. An anti-inflammatory pharmaceutical composition which comprises a suitable pharmaceutical excipient in combination with the compound of claim 1 in an amount sufficient to effect an anti-inflammatory response when administered to a mammal having need thereof.

4,188,386

COMPOSITIONS CONTAINING THIOCYANIC ACID AND HEXAMETHYLENE-TETRAMINE, PRODUCTION PROCESS AND ADMINISTRATION THEREOF AS BACTERICIDE AND MYCOCIDE

Robert Engl, Wasserburg, and Hans Richter, Reitmehring, both of Fed. Rep. of Germany, assignors to Meggle Milchindustrie GmbH & Co. KG, Reitmehring, Fed. Rep. of Germany

Filed Nov. 7, 1977, Ser. No. 849,262
Int. Cl.[2] A61K *31/53*
U.S. Cl. 424—249 15 Claims

1. A dry stable bactericidal and mycocidal composition comprised of (1) the unisolated reaction product of hexamethylenetetramine with an alkali or alkaline earth metal thiocyanate in the aqueous phase in the presence of acid and (2) a physiologically harmless carrier substance substantially inert towards the reaction compounds and the products thereof; wherein said composition is prepared by a process comprising:

(a) reacting hexamethylenetetramine with an alkali or alkaline earth metal thiocyanate in the aqueous phase in the presence of acid;

(b) combining the aqueous solution product obtained in said reaction, without isolation of reaction product, with a physiologically harmless carrier substance substantially inert towards the reaction compounds and the products thereof; and

(c) drying said combined carrier and aqueous solution at a temperature which does not exceed the boiling point of water in said solution;

whereby said composition possesses superior storage stability relative to compositions comprised solely of hexamethylenetetramine thiocyanate.

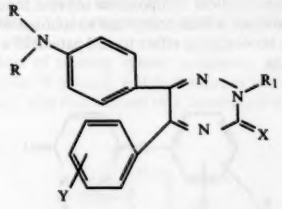
4,188,387

AMINO-ARYL 1,24-TRIAZINES USEFUL IN THE TREATMENT OF DIVERSE PAIN

Guy Pitet, Toulouse; Henri Cousse, Castres; Gilbert Mouzin, Castres, and Antoine Stenger, Castres, all of France, assignors to Pierre Fabre S.A., France

Filed Mar. 9, 1978, Ser. No. 884,732
Claims priority, application France, Mar. 9, 1977, 77 07245; Feb. 17, 1978, 78 04822
Int. Cl.[2] C07D *253/06, 413/10;* A61K *31/53*
U.S. Cl. 424—249 24 Claims

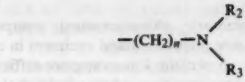
1. A chemical compound selected from the group having the formula:



in which:

R is a lower alkyl

R_1 is lower alkyl, allyl, aminoalkyl of the type



in which n=2 to 4 and R_2R_3 represent lower alkyl and may also form a heterocycle with the nitrogen atom, in which the carbon chain may be uninterrupted or interrupted by a single oxygen atom so as to form a morpholine radical with the oxygen in the 4 position thereof

Y is hydrogen, halogen, lower alkyl, or

wherein R is lower alkyl,

X=an oxygen or sulfur atom and salts thereof with therapeutically acceptable organic or inorganic acids.

10. A compound of claim **1** which is 2-methyl 3-thione 5,6-di(para-dimethylaminophenyl) as triazine.

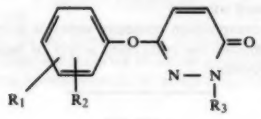
4,188,388

PHENOXY PYRIDAZINONES AND ANOREXIGENIC USE THEREOF

Germaine Thuillier, born Nachmias, Paris, and Sylviane S. J. Mignonac, born Mondon, Chilly-Mazarin, both of France, assignors to Albert Rolland S.A., Paris, France

Filed Apr. 21, 1978, Ser. No. 898,988
Claims priority, application France, Apr. 28, 1977, 77 12888
Int. Cl.[2] **A61K** *31/50;* **C07D** *237/16*
U.S. Cl. 424—250 **18 Claims**

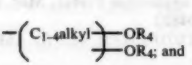
1. A compound of the formula



wherein

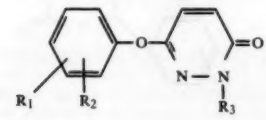
each of R_1 and R_2 is independently selected from the group consisting of hydrogen, halogen, C_{1-3} alkyl, C_{1-3} alkoxy and trifluoromethyl;

R_3 is —(C_{1-4} alkyl)—OR_4 or



R_4 is hydrogen, benzoyl, (C_{1-4} alkyl)-benzoyl, halobenzoyl or (C_{1-4} alkoxy)-benzoyl.

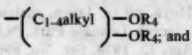
10. A pharmaceutical composition suitable for treating an overweight patient which comprises an amount effective for providing an anorexigenic effect to said patient of a compound of the formula



wherein

each of R_1 and R_2 is independently selected from the group consisting of hydrogen, halogen, C_{1-3} alkyl, C_{1-3} alkoxy and trifluoromethyl;

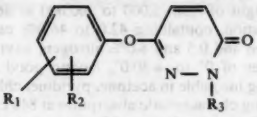
R_3 is —(C_{1-4} alkyl)—OR_4 or



R_4 is hydrogen, benzoyl, (C_{1-4} alkyl)-benzoyl, halobenzoyl or (C_{1-4} alkoxy)-benzoyl;

and a pharmaceutically acceptable carrier for said compound.

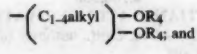
18. A pharmaceutical composition suitable for treating a patient requiring a psychoanaleptic effect which comprises an amount effective for providing said psychoanaleptic effect to said patient of a compound of the formula:



wherein

each of R_1 and R_2 is independently selected from the group consisting of hydrogen, halogen, C_{1-3}alkyl, C_{1-3}alkoxy and trifluoromethyl;

R_3 is —(C_{1-4}alkyl)—OR_4 or



R_4 is hydrogen, benzoyl, (C_{1-4}alkyl)-benzoyl, halobenzoyl or (C_{1-4}alkoxy)-benzoyl;

and a pharmaceutically acceptable carrier for said compound.

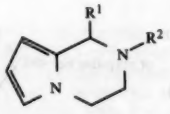
4,188,389

1,2,3,4-TETRAHYDROPYRROLO(1,2-A)PYRAZINES

Ivo L. Jirkovsky, Montreal, Canada, assignor to Ayerst McKenna & Harrison, Inc., Montreal, Canada

Filed Nov. 3, 1978, Ser. No. 957,602
Int. Cl.[2] **A61K** *31/495;* **C07D** *487/04*
U.S. Cl. 424—250 **12 Claims**

1. A compound of formula I



(I)

in which R^1 is lower alkyl, cyclo(lower)alkyl, phenyl or phenyl mono-, di- or trisubstituted with lower alkyl or lower alkoxy and R^2 is hydrogen, lower alkyl, cyclo(lower)alkyl, 2-(indole-3-yl)ethyl or phenyl(lower) alkylene or a therapeutically acceptable acid addition salt thereof.

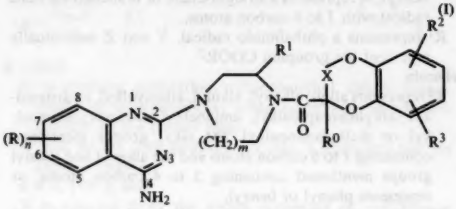
11. A method of treating depression in a mammal, which comprises administering to said mammal an effective antidepressant amount of a compound of claim **1**.

4,188,390
ANTIHYPERTENSIVE 4-AMINO-2-[4-(1,4-BENZODIOXAN-2-CARBONYL) PIPERAZIN-1-YL OR HOMOPIPERAZIN-1-YL]QUINAZOLINES

Simon F. Campbell, Deal, England, assignor to Pfizer Inc., New York, N.Y.

Filed Oct. 18, 1978, Ser. No. 952,317
Claims priority, application United Kingdom, Nov. 5, 1977, 46128/77; Denmark, Sep. 27, 1978, 4286/78
Int. Cl.[2] A61K *31/505;* C07D *405/14*
U.S. Cl. 424—251 6 Claims

1. A compound of the formula



(I)

wherein

$(R)_n$ is selected from the group consisting of 6,7-di(lower alkoxy) or 6,7,8-tri(lower alkoxy);

m is 1 or 2;

X is selected from the group consisting of —CHR[1]— or —CH_2CH_2—;

each of R^1 and R^0 is selected from the group consisting of hydrogen or lower alkyl;

and R^2 and R^3, which may the same or different, are selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, halogen, lower alkanoyl, lower alkoxycarbonyl or a group of the formula —$CONR^4R^5$ or —$SO_2NR^4R^5$ wherein R^4 and R^5, which may the same or different, are selected from the group consisting of hydrogen or lower alkyl; and the pharmaceutically acceptable acid addition salts thereof.

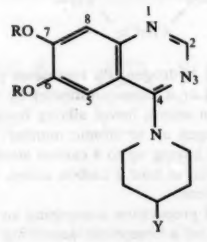
6. A pharmaceutical composition comprising a cardiovascular regulating amount of a compound according to claim 1 or a pharmaceutically acceptable acid addition salt thereof together with a pharmaceutically acceptable diluent or carrier.

4,188,391
4-[4-(SUBSTITUTED)PIPERIDINO]QUINAZOLINE CARDIAC STIMULANTS

Simon F. Campbell, Deal; John C. Danilewicz, Ash, Nr. Canterbury; Allan L. Ham, Broadstairs, and John K. Stubbs, Deal, all of England, assignors to Pfizer Inc., New York, N.Y.

Filed Oct. 26, 1978, Ser. No. 954,931
Claims priority, application United Kingdom, Nov. 3, 1977, 45669/77
Int. Cl.[2] A61K *31/505;* C07D *401/04*
U.S. Cl. 424—251 13 Claims

1. A compound of the formula:



(I)

wherein R is a lower alkyl group; and

Y represents a group of the formula:

$-(CHR^1)_m-Z$

wherein R^1 is selected from the group consisting of hydrogen and lower alkyl; m is 1 or 2, with the proviso that when m is 2, each R^1 may be the same or different; and Z is selected from the group consisting of

$-OCONR^4R^5$;

$-N(R^2)COR^3$;

$-N(R^2)SO_2R^3$; and

$-N(R^2)CONR^4R^5$;

wherein R^2 is selected from the group consisting of hydrogen and lower alkyl; R^3 is selected from the group consisting of alkyl, benzyl and phenyl; and R^4 and R^5 are each independently selected from the group consisting of hydrogen and a group as defined for R^3 above; and the pharmaceutically acceptable acid addition salts thereof.

13. A pharmaceutical composition comprising a cardiac stimulating amount of a compound according to claim 1, or a pharmaceutically acceptable acid addition salt thereof, together with a pharmaceutically acceptable diluent or carrier.

4,188,392
ANTIMICROBIAL COMPOSITIONS

Charles D. Hufford, Oxford, Miss., assignor to The University of Mississippi, University, Miss.

Continuation-in-part of Ser. No. 596,282, Jul. 16, 1975, Pat. No. 4,093,717. This application Mar. 17, 1978, Ser. No. 887,932
The portion of the term of this patent subsequent to Jun. 6, 1995, has been disclaimed.
Int. Cl.[2] A61K *31/47*
U.S. Cl. 424—258 10 Claims

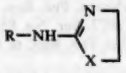
1. An antimicrobial composition comprising a compound or mixture of compounds selected from the group consisting of liriodenine, liriodenine methiodide, dehydroglaucine, oxoglaucine methiodide and mixtures thereof in admixture with a non-toxic pharmaceutically acceptable or non-phytoxic agriculturally inert carrier in a therapeutically effective concentration.

4,188,393
TREATING SPASTIC CONDITIONS OR RELAXING MUSCLES

Peter Neumann, Berne, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 898,558, Apr. 21, 1978, Pat. No. 4,145,421. This application Dec. 18, 1978, Ser. No. 970,613
Claims priority, application United Kingdom, Apr. 22, 1977, 16914/77; Apr. 22, 1977, 16915/77
Int. Cl.[2] A61K *31/42, 31/47, 31/415*
U.S. Cl. 424—258 7 Claims

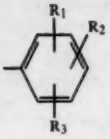
1. A method of treating spastic conditions in animals or relaxing muscles in animals which comprises administering a therapeutically effective amount of a compound of formula I,



I

wherein either

(i) X is oxygen and R is a radical of formula II,

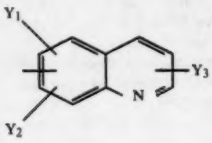


II

wherein each of R_1, R_2 and R_3, independently, is hydrogen, halogen, alkyl, alkoxy, nitro, cyano, hydroxy or alkylthio,

or (ii) X is imino and R is a radical of formula III,

III,



III

wherein

Y_1 and Y_2, independently, are hydrogen, halogen, alkyl, alkoxy, nitro, trifluoromethyl, cyano, hydroxy or alkylthio, and

Y_3 is hydrogen, alkyl or alkoxy,

in free base form or in pharmaceutically acceptable acid addition salt form thereof to an animal in need of such treatment.

4,188,394

OPHTHALMIC COMPOSITION AND METHOD OF USE

Kenneth E. Eakins, Sparkill, and Parimal Bhattacherjee, Nyack, both of N.Y., assignors to Nelson Research & Development Company, Irvine, Calif.

Filed May 8, 1978, Ser. No. 903,586

Int. Cl.[2] A61K *31/475*

U.S. Cl. 424—262 **8 Claims**

1. A method for reducing intraocular pressure in humans and animals comprising topically administering to the eye of a human or animal having elevated intraocular pressure an effective, intraocular pressure reducing amount of vinblastine together with a suitable ophthalmic pharmaceutical carrier.

5. A method for treating glaucoma in humans comprising topically administering to the eye of a human having glaucoma an effective, intraocular pressure reducing amount of vinblastine together with a suitable ophthalmic carrier.

4,188,395

1,4-DIHYDROPYRIDINE DERIVATIVES SUBSTITUTED IN THE 2 POSITION, AND THEIR USE AS MEDICAMENTS

Friedrich Bossert, Wuppertal; Egbert Wehinger, Velbert; Horst Meyer, Wuppertal; Arend Heise, Wuppertal; Stanislav Kazda, Wuppertal; Kurt Stoepel, Wuppertal; Robertson Towart, Wuppertal; Wulf Vater, Leverkusen, and Klaus Schlossmann, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

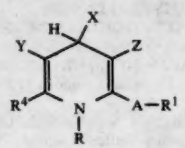
Filed Dec. 1, 1977, Ser. No. 856,559

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 2658183

Int. Cl.[2] C07D *213/55;* A61K *31/44*

U.S. Cl. 424—266 **13 Claims**

1. A 1,4-Dihydropyridine derivative of the formula (I)



(I)

or a pharmaceutically acceptable acid addition salt thereof, in which

R represents hydrogen, alkyl with 1 to 4 carbon atoms, or benzyl, A represents a straight-chain or branched alkylene radical with 1 to 6 carbon atoms,

R^1 represents a phthalimido radical, Y and Z individually represent the grouping $COOR^2$

wherein

R^2 represents alkyl, alkenyl, alkinyl, alkoxyalkyl, hydroxyalkyl, alkylmercaptoalkyl, aminoalkyl monoalkylaminoalkyl or dialkylaminoalkyl, the alkyl groups mentioned containing 1 to 6 carbon atoms and the alkenyl and alkinyl groups mentioned containing 2 to 4 carbon atoms, or represents phenyl or benzyl,

R^4 represents hydrogen, alkyl or alkoxyalkyl with 1 to 4 carbon atoms, or represents the radical $A—R^1$,

wherein

A and R^1 have the above-mentioned meaning, and X represents a phenyl radical which is optionally substituted by one or two identical or different substituents, selected from nitro, halogen, trifluoromethyl, cyano, phenyl, trifluoromethoxy, amino, alkylamino, alkyl, alkoxy or alkylmercapto with 1 or 2 carbon atoms in the alkyl radical in each case, or represents a naphthyl, pyridyl, thienyl, or benzyl radical which is unsubstituted or substituted by nitro or halogen.

4,188,396

NEW PHENYLAZACYCLOALKANES

Georges Haas, Binningen; Alberto Rossi, Oberwil; Pier G. Ferrini, Binningen, and Oswald Schier, Oberwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 6, 1978, Ser. No. 867,644

Claims priority, application Switzerland, Jan. 17, 1977, 529/77

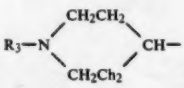
Int. Cl.[2] C07D *211/22;* A61K *31/445;* C07D *211/14*

U.S. Cl. 424—267 **7 Claims**

1. A compound of the formula I

(I)

wherein R_1 represents a radical of the formula



wherein R_3 represents hydrogen, Ph represents p-phenylene which is unsubstituted or is mono-substituted by lower alkyl having up to 4 carbon atoms, lower alkoxy having up to 4 carbon atoms or halogen up to atomic number 17, and R_2 represents lower alkyl having up to 4 carbon atoms, with the proviso, that R_2 contains at least 2 carbon atoms, when Ph is unsubstituted p-phenylene.

7. A pharmaceutical preparation comprising an antidepressive effective amount of a compound according to claim **1** together with a pharmaceutically acceptable carrier.

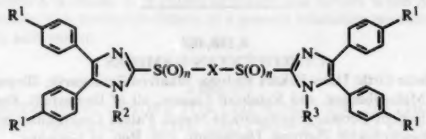
4,188,397

2,2-ALKYLDIYLBIS(THIO)BIS(IMIDAZOLES)

David T. Hill, North Wales, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed Sep. 22, 1978, Ser. No. 944,672
Int. Cl.[2] A61K *31/415;* C07D *233/84*
U.S. Cl. 424—273 R 17 Claims

1. A compound of the formula:



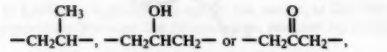
in which:

R^1 is methoxy, methylthio, trifluoromethyl, chloro, fluoro, bromo or methylenedioxy when taken with an adjacent position on the phenyl ring;

R^2 and R^3 are both hydrogen or one is hydrogen and the other is methyl;

n is 0, 1 or 2; and

X is selected from the group consisting of $-(CH_2)_m-$ where m is 0 to 4 provided that m is not 0 when R^1 is chloro,



or a non-toxic, pharmaceutically acceptable salt thereof.

16. A method of regulating cell-mediated immunity and/or producing anti-arthritic activity which comprises administering internally to an animal in need thereof a compound of claim 1 in an amount sufficient to produce said activity(ies).

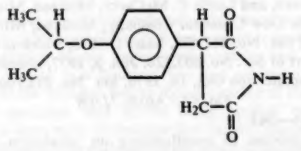
4,188,398

METHOD FOR TREATING EPILEPSY

Oganes L. Mndzhoian, 2 proezd ulitsy Tumaniana, 5, kv. 6; Svetlana A. Avetisian, ulitsa Knuniantsa, 7, kv. 61; Nina E. Akopian, ulitsa Charentsa, 4, kv. 8, and Dzhemma A. Gerasimian, ulitsa Moskovskaya, 8, kv. 21, all of Erevan, U.S.S.R.

Filed Feb. 6, 1978, Ser. No. 875,412
Int. Cl.[2] A61K *31/40*
U.S. Cl. 424—274 1 Claim

1. A method for treating epilepsy by administering to a patient an anticonvulsant containing as an active principle, 0.25 grams of α-/para-isopropoxyphenyl/succinimide of the formula:



in conjunction with a pharmaceutically effective carrier.

4,188,399

PROCESS FOR PREPARING A HEAT COAGULABLE VISCOUS PROTEIN

Michael Shemer, Worthington, Ohio, assignor to Miles Laboratories, Inc., Elkhart, Del.

Filed Dec. 23, 1974, Ser. No. 535,944
Int. Cl.[2] A23J *3/00, 1/14*
U.S. Cl. 426—276 16 Claims

1. A process for producing a heat coagulable viscous protein product substantially free of added salts which comprises:

a. forming an aqueous slurry of an oleaginous seed material present at a solids concentration of less than about 15 percent (weight/volume basis) based upon the total volume, said slurry having a pH of about 5.1 to about 5.9;

b. separating the liquid from the solids portion of said slurry; and

c. recovering said protein product from said separated liquid.

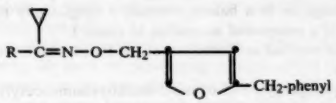
4,188,400

FURYLMETHYLOXIME ETHERS

Michael J. Bull, Lower Halstow, England, assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 12, 1979, Ser. No. 29,172
Claims priority, application United Kingdom, May 18, 1978, 20510/78
Int. Cl.[2] C07D *307/52;* A01N *9/20*
U.S. Cl. 424—285 4 Claims

1. A compound of the formula



wherein R is naphthyl, phenyl, halophenyl, or alkylphenyl or alkoxyphenyl wherein the alkyl moiety contains from one to four carbon atoms.

4. A method for protecting plants from attack by insects which comprises applying to the plants to be protected an effective dosage of a compound of claim 1.

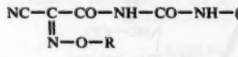
4,188,401

COMBATING FUNGI WITH 1-(ω-SUBSTITUTED PENTYL)-3-(2-CYANO-ACETYL)-UREAS

Wilhelm Brandes, Cologne, and Werner Daum, Krefeld, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 25, 1978, Ser. No. 909,743
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1977, 2725315; Dec. 24, 1977, 2758108
Int. Cl.[2] C07C *121/46, 121/34, 121/66;* A01N *9/20*
U.S. Cl. 424—304 12 Claims

1. A 1-(ω-substituted pentyl)-3-(2-cyano-acetyl)-urea of the formula



in which

R represents R^1, CO—R^2, CO—NH—R^3 or CO—OR^4,

R^1 represents unsubstituted alkyl with 1 to 10 carbon atoms; or represents alkyl with 1 to 4 carbon atoms substituted by a member selected from the group consisting of a vinyl group, an alkynyl group with up to 4 carbon atoms, an alkylcarbonyl group with 2 to 5 carbon atoms, an alkoxycarbonyl group with 2 to 5 carbon atoms, an alkenoxycarbonyl or alkynoxycarbonyl group with 4 to 5 carbon atoms, an aminocarbonyl group, an N-alkylaminocarbo-

nyl or N-cycloalkylaminocarbonyl group with up to 7 carbon atoms in either case, or a N-phenylaminocarbonyl group which can optionally have C_1–C_4 alkyl and/or chlorine as further substituents on said phenyl radical; or represents benzyl; or represents benzyl substituted in the aromatic part by a member selected from the group consisting of a methyl, methoxy, methylenedioxy, nitro, trifluoromethyl, benzoyl, monochlorobenzoyl, dichlorobenzoyl, phenyl or phenoxy group or by 1 to 4 chlorine atoms;

R^2 represents a straight-chain or branched, saturated or unsaturated hydrocarbon radical with up to 8 carbon atoms; or a straight-chain or branched, saturated or unsaturated hydrocarbon radical with up to 8 carbon atoms substituted by a member selected from the group consisting of chlorine, bromine or a cyano group,

R^3 represents a straight-chain or branched alkyl radical with up to 11 carbon atoms, or represents a straight-chain or branched alkyl radical with up to 11 carbon atoms substituted by a member selected from the group consisting of a cyano group or an alkoxycarbonyl radical with up to 5 carbon atoms, or represents a phenyl radical, or a phenyl radical substituted by member selected from the group consisting of a methyl, nitro or trifluoromethyl group or by chlorine,

R^4 represents a saturated or unsaturated aliphatic group with up to 4 carbon atoms,

Q represents CN, CO—NH_2, COOH or CO—OR^5, and

R^5 denotes an alkyl group with 1 to 4 carbon atoms.

10. A method of combating fungi which comprises applying to the fungi, or to a habitat thereof, a fungicidally effective amount of a compound according to claim **1**.

11. The method according to claim **10**, in which said compound is

1-(5-cyanopentyl)-3-(2-cyano-2-methoxyiminoacetyl)-urea,

1-(5-cyanopentyl)-3-(2-cyano-2-hexyloximinoacetyl)-urea,

1-(5-cyanopentyl)-3-(2-cyano-2-ethoxyiminoacetyl)-urea or

1-(5-aminocarbonyl-pentyl)-3-(2-cyano-2-methoxyimino-acetyl)-urea.

4,188,402

DERIVATIVES OF THE D-THREO-1-PHENYL-2-TRIFLUOROACETAMIDO-1,3-PROPANDEDIOL

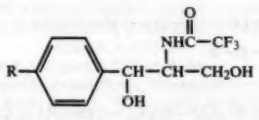
Mario Portelli, Vicenza; Davide DellaBella, Milan; Giuseppe Cervato, Vicenza, and Gianfranco Marca, Vimercate, all of Italy, assignors to Clesa S.p.A., Vicenza, Italy

Filed Aug. 5, 1977, Ser. No. 822,258

Int. Cl.[2] A61K *31/165*

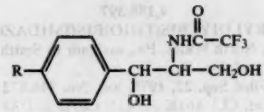
U.S. Cl. 424—324 **9 Claims**

1. A D-threo compound of the formula:



wherein R is methylmercapto or methanesulphonyl; and the non-toxic pharmacologically acceptable acid addition salts thereof.

7. A method of treating bacterial infection, which comprises the oral, rectal or parenteral administration of an effective amount of a D-threo compound of the formula as the active ingredient;



wherein R is methylmercapto or methanesulphonyl; or a non-toxic pharmacologically acceptable acid addition salt thereof.

4,188,403

CYCLOPENTAN-1-AMINES

Dieter Orth; Hans-Eckart Radunz; Manfred Baumgarth; Jürgen Maisenbacher, and Reinhard Lissner, all of Darmstadt, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

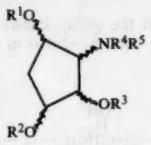
Filed Dec. 21, 1977, Ser. No. 863,001

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658401

Int. Cl.[2] A61K *31/135*; C07C *91/16*

U.S. Cl. 424—330 **20 Claims**

1. A cyclopentane-1-amine of the Formula



and the physiologically acceptable salts thereof, wherein R^1 and R^2 each is hydrogen or benzyl; R^3 is alkyl of 5–10 C-atoms or 2-hydroxyalkyl of 5–10 C-atoms; R^4 is hydrogen, methyl or ethyl, R^5 is alkyl of 5–10 C-atoms; and the wavy line ( ) indicates that a bond can be in the α- or β-position.

19. A pharmaceutical composition comprising an amount of a compound of claim **1** effective for inhibiting the aggregation or adhesion of thrombocytes and a pharmaceutically acceptable carrier.

20. A method of inhibiting aggregation or adhesion of thrombocytes in mammals which comprises administering an amount of a compound of claim **1** effective for such inhibition.

4,188,404

TREATMENT OF SYMPTOMS OF AGING

Richard A. Guarino, Glen Ridge, N.J., assignor to USV Pharmaceutical Corporation, Tuckahoe, N.Y.

Filed Jun. 12, 1978, Ser. No. 914,339

Int. Cl.[2] A61K *31/135*

U.S. Cl. 424—330 **2 Claims**

1. A method for improving the Sandoz Clinical Assessment-Geriatric rating in aged patients which comprises orally administering to aged patients requiring such improvement an effective amount of nylidrin hydrochloride.

4,188,405

DEUTERATED 1,1-DIFLUORO-2,2-DIHALOETHYL DIFLUOROMETHYL ESTERS

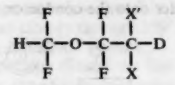
Eric R. Larsen, and Leslie P. McCarty, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 882,498, Mar. 1, 1978, which is a continuation-in-part of Ser. No. 803,926, Jun. 6, 1977, abandoned. This application Oct. 16, 1978, Ser. No. 951,706

Int. Cl.[2] A61K *31/08*

U.S. Cl. 424—342 **12 Claims**

1. The process of anesthetizing an inhalation anesthetic susceptible animal which comprises administering an effective anesthetizing amount of a compound of the formula



wherein X and X' represent a halogen selected from the group consisting of chloro, fluoro, and bromo with the proviso that when X is chloro X' is chloro or fluoro, and further when X is fluoro X' is bromo or chloro, as a general inhalation anesthetic to said animal.

4,188,406

POLYMERIC BINDER FOR CHEWING GUM, METHOD FOR PREPARING SAME AND CHEWING GUM BASED ON SAID POLYMERIC BINDER

Levon A. Sarkisian; Stepan G. Matsoian; Vagram G. Gabzimalian; Shaen M. Mailian; Albert P. Galstian; Vazgen K. Azarian; Zorik S. Ter-Davtian; Raya G. Gevorkian; Ogden A. Gevorkian; Korjun L. Khudoian; Lavrenty A. Ovsepian; Amalia A. Arutjunova, and Foerbakh V. Mkrtchian, all of Erevan, U.S.S.R., assignors to Institut Organicheskoi Khimii Akademii Nauk Armyanskoi, Erevan, U.S.S.R.

Filed Jul. 10, 1978, Ser. No. 923,637

Int. Cl.² A23G *3/30*

U.S. Cl. 426—3 **3 Claims**

1. A polymeric binder for chewing gum consisting of an oligomer of vinylacetate with a molecular weight of from 2,500 to 6,000 and a plastifying agent, viz. water, at the following proportions between the components, percent by weight:

vinylacetate oligomer	70–80
water	30–20.

4,188,407

PROCESSES FOR PRODUCING ACTIVE DRIED YEAST

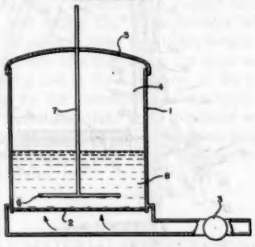
Frederick S. M. Grylls, Morden, England; Stanley D. Rennie, Menstrie, and Michael Kelly, Stirling, both of Scotland, assignors to The Distillers Company (Yeast) Limited, Morden

Continuation-in-part of Ser. No. 716,852, Aug. 23, 1976, abandoned. This application Apr. 3, 1978, Ser. No. 892,802

The portion of the term of this patent subsequent to Mar. 28, 1995, has been disclaimed.

Int. Cl.² C12C *11/30*

U.S. Cl. 426—62 **7 Claims**



1. A method in which powdered active dried yeast having a dry matter content of 90 to 97% by weight is made by a process comprising drying moist yeast particles less than about 0.35 mm in size in a fluidised bed and subjecting the yeast particles in the fluidised bed to forces capable of disintegrating of yeast particles, said forces being applied continuously through at least most of the time that the dry matter content is between 50 and 70% and said forces being sufficient to prevent any substantial increase in particle size but insufficient to break the yeast cells themselves, with the resulting dried yeast particles substantially all passing through a sieve having a mesh size of 0.35 mm.

4,188,408

PROTECTED IRON TRACER COMPOSITION AND METHOD OF MAKING

Sylvan Eisenberg, San Francisco, Calif., assignor to Microtracers Inc., San Francisco, Calif.

Continuation-in-part of Ser. No. 542,357, Jan. 20, 1975, Pat. No. 4,029,820. This application Jul. 18, 1975, Ser. No. 597,298

The portion of the term of this patent subsequent to Jun. 14, 1994, has been disclaimed.

Int. Cl.² A23K *1/175*

U.S. Cl. 426—74 **12 Claims**

1. A composition of matter comprising a major portion of finely divided iron particles of about 35–325 mesh having adsorbed thereon a minor portion of a compound selected from the class consisting of sodium carbonate, tri-sodium phosphate and sodium silicate, said iron being selected from the class consisting of iron grits and reduced iron.

4,188,409

BEVERAGE PRODUCT AND PROCESS

Charles Kay, 9390 Whitneyville Ave., Alto, Mich. 49302

Continuation-in-part of Ser. No. 803,147, Jun. 3, 1977, abandoned. This application Oct. 3, 1978, Ser. No. 948,166

Int. Cl.² A23F *1/14*

U.S. Cl. 426—78 **12 Claims**

1. A brewable coffee-type product comprising: matrix granules of shells of edible nuts having pulverized coffee retained at the surfaces thereof.

8. A method of producing a brewable coffee-type product comprising the steps of: pulverizing roasted coffee to powder form; forming an aqueous slurry liquor of the coffee powder; blending said slurry liquor with matrix granules of shells of edible nuts to form a damp mass; and evaporating the moisture from said damp mass to dry said damp mass to a flowable granular product.

4,188,410

FOAM FRYING

Joseph M. Rispoli, Massapequa Park; Morris A. Rogers, Mt. Vernon; Rex J. Sims, Pleasantville, and Reuben H. Waitman, Sr., Pearl River, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Jun. 29, 1978, Ser. No. 920,527

Int. Cl.² A23L *1/01*

U.S. Cl. 426—296 **26 Claims**

1. A method for frying comestibles which comprises:

frying a comestible in a frying medium which comprises an oil or fat and an amount of an emulsifier effective to foam said oil or fat during frying, wherein the amount of fat or oil and emulsifier is effective to foam said fat or oil at a level sufficient to cook said comestible in the foaming frying medium and create an artificially high level of heat transfer medium, said level of foam creating at least a 25% increase in the height of the fat or oil.

4,188,411

METHOD OF PREPARING A PROTEIN-ENRICHED UNRIPENED CHEESE COMPOSITION

Arie Kuipers, and Karl Schröder, both of Reitmehring, Fed. Rep. of Germany, assignors to Meggle Milchindustrie GmbH & Co. KG, Munich, Fed. Rep. of Germany

Filed Jan. 26, 1976, Ser. No. 652,181

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1975, 2503840

Int. Cl.² A23C *19/02, 19/12, 21/00*

U.S. Cl. 426—582 **7 Claims**

1. A method of making an unripened cheese which com-

prises: (a) adjusting a fluid, water-bearing concentrate of water-soluble whey protein to a pH value between 2.5 and 3.7, said value being below the isoelectric point of said whey protein; (b) heating the adjusted concentrate to an elevated temperature for a period sufficient to increase the viscosity thereof; and (c) dispersing the fluid concentrate of increased viscosity in unripened cheese.

4,188,412

NON-FOAMING, CLEAR, AEROSOL VEGETABLE OIL COMPOSITIONS CONTAINING LECITHIN, ETHYL ALCOHOL AND HYDROCARBON PROPELLENTS

Vasant D. Sejpal, Jersey City, N.J., assignor to American Home Products Corporation, New York, N.Y.

Filed May 30, 1978, Ser. No. 910,701
Int. Cl.[2] A23J *7/02*
U.S. Cl. 426—609 **13 Claims**

12. A pan release and basting composition comprising:

A. From 3 to 15 percent by weight of a member selected from the group consisting of bleached and unbleached natural lecithin containing about 50 to 54 percent phosphatides, hydroxylated lecithin containing about 66 to 72 percent phosphatides and powdered and granular lecithin containing up to about 95 percent phosphatides;

B. From 7.5 to 25 percent by weight of an alcohol selected from the group consisting of 190° to 200° proof ethyl alcohol and ethyl alcohol denatured with a generally recognized as a safe food grade denaturant;

C. From 5 to 65 percent by weight of a liquid vegetable oil selected from the group consisting of soybean oil, corn oil, cottonseed oil, peanut oil, safflower oil, olive oil, sesame oil, peanut oil, coconut oil, coconut butter, palm nut oil and other glyceryl esters of lauric, linoleic, oleic, and linolenic acids, including their lightly hydrogenated liquid derivatives; and

D. From 10 to 75 percent by weight of a food grade hydrocarbon propellent selected from the group consisting of propane, butane, isobutane, isopentane and mixtures thereof.

4,188,413

ELECTROSTATIC-FLUIDIZED BED COATING OF WIRE

John H. Lupinski, Scotia, and Bernard Gorowitz, Elnora, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 733,236, Oct. 18, 1976, Pat. No. 4,100,883.
This application Jan. 20, 1978, Ser. No. 871,153
Int. Cl.[2] B05D *1/06*; B05B *5/02*; B05D *7/20*
U.S. Cl. 427—30 **24 Claims**

1. A process for continuously applying a controlled thickness coating on an elongate electrical conductor, comprising the steps of

(a) providing an upwardly extending hollow member having an upwardly facing port,

(b) providing a bed of powder about said hollow member,

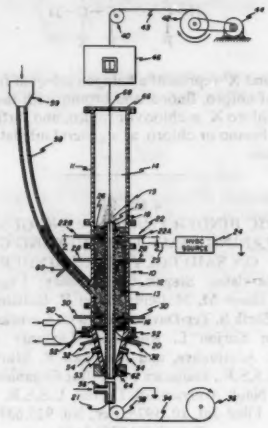
(c) fluidizing said bed to an extent such that the upper surface of the bed is below the port,

(d) electrically charging the fluidized bed with an electrical potential different from the electrical potential of the conductor by electrically charging electrode means disposed within said bed,

(e) said conductor being a rectangular wire having an elongate cross-sectional shape including opposite narrow ends interconnected by a pair of elongate opposite sides,

(f) disposing said electrode means in a angularly spaced apart, generally horizontal array with at least one charged electrode porjecting radially inwardly toward each elongate cross-section side of the rectangular wire and no electrode projecting inwardly toward either of said cross-sectional narrow sides,

(g) advancing the conductor along a path through said hollow member and upwardly out of said port to effect coating of the powder onto the conductor,



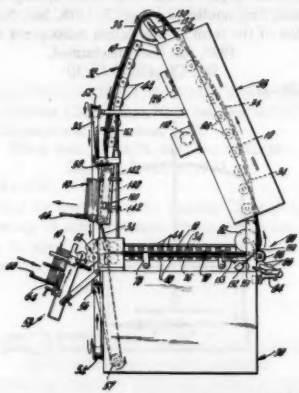
(h) adjusting the height of the port above the upper surface of the bed to control the thickness of the powder coating.

4,188,414

METHOD FOR APPLYING SEALING MATERIAL TO ENVELOPES

Robert Cohn, Millbrae, Calif., assignor to Champion International Corporation, Stamford, Conn.

Division of Ser. No. 490,203, Jul. 19, 1974, Pat. No. 3,965,851.
This application Jan. 2, 1976, Ser. No. 646,153
The portion of the term of this patent subsequent to Mar. 12, 1999, has been disclaimed.
Int. Cl.[2] B05D *3/06*
U.S. Cl. 427—45.1 **4 Claims**



1. A method for applying sealing material to the flap closures and opposed body portions of a plurality of envelopes, each envelope having a folded edge portion opposite the flap closure, comprising the steps of:

feeding a linear array of envelopes to a continuous, generally triangular closed loop conveying means including upper and lower conveyor belts which respectively grip the opposed surfaces of the body portion of each envelope

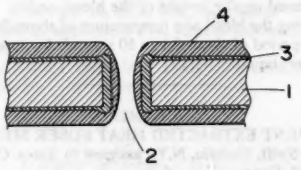
along the folded edge portion thereof, with the flap closure being disposed below the plane of said envelope;
rotating each flap closure through 180° about said fold line to a generally horizontal position;
rotating each envelope around the first apex of said generally triangular closed loop conveying means and simultaneously stamping strips of sealing material respectively to the flap portion and body portion of each envelope;
consecutively heating said linear array of envelopes by dielectric dryer means to dry the sealing material applied to each envelope;
rotating each envelope around the second apex of the generally triangular closed loop conveying means; and
consecutively removing said envelope from said conveying means at a point adjacent the initial feeding position of said envelopes.

4,188,415

BASEBOARD FOR PRINTED CIRCUIT BOARD AND METHOD OF PRODUCING THE SAME

Hiroshi Takahashi, Kasama; Kiyoshi Nakao, Yuki, and Masaaki Katagiri, Houya, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Sep. 14, 1977, Ser. No. 833,359
Claims priority, application Japan, Sep. 14, 1976, 51-110268
Int. Cl.² B05D *5/12*
U.S. Cl. 427—97 **27 Claims**



1. A method of producing a baseboard for a printed circuit board comprising applying onto the surface of a metal substrate a resin coating, characterized in that the application of a resin coating is effected by dipping a metal substrate having through-holes in a solution of a resin in a solvent which solution has a resin concentration of not more than 50% by weight and a viscosity of not more than 50 centipoises and taking the metal substrate out of said solution in a direction of at an angle of 90°±30° with respect to the axis of the through-holes of said metal substrate at a velocity of not more than 1,000 mm/min to form a resin coat layer covering the overall surface of the metal substrate and filling the through-holes which, upon drying, forms a membrane over said holes which breaks and results in the formation of a coating on the inner wall surfaces of the through-holes and in the formation, at the circumferential edges formed by the intersection of the upper and lower surfaces of said metal substrate with the inner walls of said through-holes, of a coating having a thickness larger than the thickness of said coating on said upper and said lower surface of the metal substrate.

4,188,416

SPRAYABLE MATERIAL FOR REPAIRING BASE PLATES OF INGOT MOLDS

Paul G. Adams, Birmingham, Ala., and Kenneth A. Gebler, Munster, Ind., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Dec. 5, 1978, Ser. No. 966,679
Int. Cl.² B26D *7/38*
U.S. Cl. 427—135 **2 Claims**

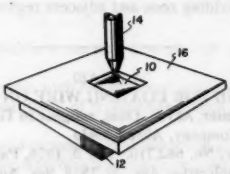
1. A process for repairing ingot mold stools which comprises:
A. Spraying onto the stool a composition comprising:
(1) 49.5%—20 mesh alumina-silicate refractory grain;
(2) 11.56%—200 mesh alumina-silicate refractory grain;
(3) 13.21%—325 mesh Al_2O_3;
(4) 1.75%—325 mesh bentonite clay;
(5) 11.99% of a binder having a composition comprising:
a. 75% phosphoric acid—77.0%;
b. alumina/trihydrate—11.2%;
c. powdered boric acid—2.35%; and,
d. water—9.45%;
(6) 11.99%—water; said composition being fluid and sprayable through a 1 inch hose having a length of 75 feet;
B. Allowing said composition to cure utilizing the residual heat in said ingot mold stool; and,
C. Recovering a repaired ingot mold stool.

4,188,417

METHOD OF APPLYING A DIELECTRIC LAYER TO A SUBSTRATE AND A MASK-FORMING COATING FOR THE APPLICATION OF A DIELECTRIC LAYER

Wolfgang Lichtenberg, Balzers, Liechtenstein, assignor to Balzers Patent-und Beteiligungs-Aktiegesellschaft, Liechtenstein

Continuation of Ser. No. 793,510, May 4, 1977, abandoned. This application Jun. 19, 1978, Ser. No. 916,560
Int. Cl.² B05D *3/02*
U.S. Cl. 427—229 **8 Claims**



1. A method of applying a dielectric layer to a substrate which can be heated to a temperature above ambient, comprising applying a mask of a suspension of metal in an organic binder to a substrate in areas not to receive the dielectric layer, heating the suspension to decompose the binder and to leave a metal deposit on a portion of the surface of the substrate in an area which is not to receive the dielectric layer and leaving an uncovered remaining area, applying the dielectric layer to the substrate on the uncovered remaining area at the elevated temperature by vapor deposition, and thereafter removing the mask by applying a solvent to dissolve the metal deposit of the mask.

4,188,418

SEPARATION PROCESS

Robert M. Livingston, Welwyn, England, assignor to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 773,037, Feb. 28, 1977, abandoned, which is a continuation of Ser. No. 708,797, Jul. 26, 1976, abandoned, which is a continuation of Ser. No. 385,014, Aug. 2, 1973, abandoned. This application Feb. 21, 1978, Ser. No. 879,657
Int. Cl.² B05D *5/00*
U.S. Cl. 427—245 **2 Claims**

1. A method of preparing an ultra-filtration membrane of improved flux comprising the steps of:
(a) applying to a support surface a slurry of a finely divided inert, impervious and water-isoluble solid particulate flux improver contained in a volatile solvent,
(b) evaporating said solvent whereby a thin layer of the flux improver is left on said support surface,
(c) applying a film of a casting dope consisting essentially of a solution of a film-forming organic polymer in a non-volatile solvent over the said layer of flux improver, and
(d) promptly thereafter contacting the said film with water to leach out the said non-volatile solvent.

4,188,419

METHOD FOR PREVENTING CRACKS BELOW SEAMS DURING PLATING AND WELDING

Klaus Detert, Neu-Isenburg; Wolfgang Bertram, Grossauheim, and Hermann Fischdick, Neu-Isenburg, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 457,176, Apr. 2, 1974, abandoned, which is a continuation of Ser. No. 225,600, Feb. 11, 1972, abandoned. This application Mar. 17, 1978, Ser. No. 887,811

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1971, 2106600

Int. Cl.[2] C21D *9/50*

U.S. Cl. 427—287 22 Claims

1. Method for preventing crack formation during stress relief annealing of weld claddings and connecting welds, comprising: conducting a welding operation, cooling the welding zone and adjacent regions after the welding operation, locally heating the regions adjacent to and extending up to a depth of no more than about 10 mm from the welding zone to temperatures of from about 700° C. and up to 1000° C. after the welding zone and adjacent regions have cooled and before the stress relief annealing of said welding zone and adjacent regions, thereby refining the coarse grained structure in said regions before the said stress relieving step, and then stress relief annealing said welding zone and adjacent regions after the local heating.

4,188,420

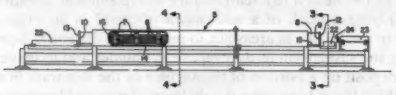
METHOD FOR COATING WIRE ON A SPOOL

Edward E. Hunter, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 682,710, May 3, 1976, Pat. No. 4,109,609. This application Apr. 20, 1978, Ser. No. 898,273

Int. Cl.[2] B05C *3/10*

U.S. Cl. 427—295 1 Claim



1. The method of treating wire tire cord comprising providing a plurality of spools each containing an indefinite running length of said wire tire cord wound continuously therearound, inserting said spools endwise in tandem into one end of an elongated hollow cylindrical pipe so as to fill the length of said pipe, closing the ends of the pipe, circulating liquid coating around said wire tire cord on said spools in said pipe, effecting a vacuum in said pipe, draining surplus of said liquid coating from said wire tire cord on the spools and from said pipe, heating said pipe to dry said liquid coating on said wire tire cord wound about said spools, and pushing said plurality of spools with dried coating thereon from the other end of said pipe by inserting a next plurality of spools into said pipe by way of said first end.

4,188,421

PROCESS FOR TREATING THE SURFACE OF GLASS FIBRE TO IMPART RESISTANCE TO ALKALIS

Katsuji Matsuura, Kamagaya, and Kunihito Arai, Tokyo, both of Japan, assignors to Dalichikasei Co., Ltd., Tokyo, Japan

Filed Mar. 22, 1978, Ser. No. 889,027

Claims priority, application Japan, Apr. 5, 1977, 52/038802

Int. Cl.[2] B05D *3/02*

U.S. Cl. 427—385 A 4 Claims

1. A method of producing an alakli resistant glass fiber for use in cement products to improve the strength thereof which comprises the steps of coating said glass fiber with an aqueous solution of white muddy composition consisting of

CONSTITUENT	PARTS (% by weight)
Water-soluble acrylate resin	50–60
Styrene-acrylate copolymer resin	5–10
Zirconium oxide	2–5
Titanium oxide	3–5
Calcium carbonate	5–10
Plasticizer	5–10
Solvent	5–10

and drying the said coated glass fiber.

4,188,422

SHRINK-RESISTANT TEXTILES CONTAINING POLYPROPYLENE PROTEINOUS FIBER BLEND PRODUCED BY IMMERSING TEXTILE IN AN INERT LIQUID AT HIGH TEMPERATURE

William L. Wasley, Pacific Grove, and Walter W. Ingenthron, Jr., Albany, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sep. 30, 1977, Ser. No. 838,289

Int. Cl.[2] B05D *1/18*

U.S. Cl. 28—167 3 Claims

1. A process for imparting improved properties to proteinous animal fibers, which comprises:

(a) blending polypropylene with the proteinous animal fiber such that the blend contains about 5–50% of polypropylene based on the weight of the blend, and

(b) heating the blend to a temperature of about 165°–250° C. for a period of about 0.1 to 60 seconds by immersing it in an inert liquid.

4,188,423

SOLVENT EXTRACTED HEAT FUSER MEMBER

Joseph A. Swift, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 6, 1977, Ser. No. 784,999

Int. Cl.[2] B05D *3/04, 3/10;* G03G *15/20*

U.S. Cl. 427—444 9 Claims

1. The method of improving the release properties of a silicone rubber coated fuser member comprising placing a cured silicone rubber coated fuser member in an environment containing an organic solvent which dissolves low molecular weight polysiloxane and siloxane components in the cured silicone rubber which interfere with the release properties of the silicone rubber, the organic solvent being one which does not react with, degrade or dissolve the cured silicone rubber, and removing the organic solvent containing the dissolved low molecular weight polysiloxane and siloxane components from the cured silicone rubber coated fuser member.

4,188,424

METAL CARRIER FOR TRIM

Tsuneo Ohno, Anjio; Kunio Maeno, Jushiyama; Takahiko Kasuya, and Takao Nakajima, both of Ichinomiya, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nagoya, Japan

Filed Dec. 20, 1977, Ser. No. 862,590

Claims priority, application Japan, Dec. 21, 1976, 51/171577[U]; Apr. 30, 1977, 52/55146[U]

Int. Cl.[2] B60R *13/02;* B32B *3/02, 3/10, 3/24, 15/06*

U.S. Cl. 428—572 9 Claims

1. A metal carrier to be embedded into rubber or plastic for use as trim, said metal carrier comprising: an elongated metal strip, a plurality of transverse slots across said strip in the central portion thereof, and link means adjacent the central portion of said strip on each side thereof, each said link means being continuous and including a plurality of first link portions having a thickness equal to the thickness of said strip, a plurality of second thin link portions having a thickness less than the thickness of said strip, and a plurality of intermediate link portions having a thickness equal to the thickness of said strip

for connecting said first and second link portions, wherein said link means are positioned with respect to said plurality of slots such that a said first link portion of said link means is adjacent to one end of a first of said slots and a said second thin link portion of said link means is adjacent to the other end of said

first of said slots and a said second thin link portion of said link means is adjacent to the one end of a second one of said slots and a said first link portion of said link means is adjacent to the other end of said slots wherein the first and second ones of said slots are adjacent to each other.

4,188,425

DOUBLE-WALLED SHAPED PLASTIC ARTICLES

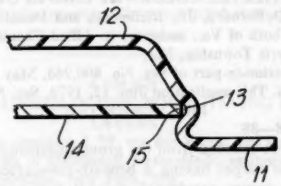
Friedrich Hanstein, Gross-Zimmern; Theodor P. Moench, Griesheim B. Darmstadt, and Günter Schreyer, Darmstadt, all of Fed. Rep. of Germany, assignors to Rohm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Apr. 14, 1978, Ser. No. 896,618

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1977, 2718949

Int. Cl.[2] **B32B** *17/00, 27/06;* **E06B** *3/24;* **C03C** *27/12*

U.S. Cl. 428—34 **5 Claims**



1. A double-walled shaped plastic glazing article comprising a first-sheet of a translucent synthetic resin of substantially uniform thickness having a geometrically regular depression formed therein having a base portion connected to surrounding planar portions of said sheet by a peripheral side wall, said side wall having a circumferential groove of uniform cross-section formed therein facing inwardly of said depression, and a second sheet of synthetic translucent resin having a peripheral edge portion which is generally complementary to the peripheral configuration of the groove being pressure fitted into said circumferential groove, said groove being spaced from said base portion of the depression to define an air chamber in the glazing article.

4,188,426

COLD PLASMA MODIFICATION OF ORGANIC AND INORGANIC SURFACES

Robert A. Auerbach, Fairview, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Dec. 12, 1977, Ser. No. 860,261

Int. Cl.[2] **B05D** *3/06*

U.S. Cl. 427—40 **3 Claims**

1. A method for reducing the coefficient of friction and increasing the hydrophobicity of the surfaces of organic substrates comprising

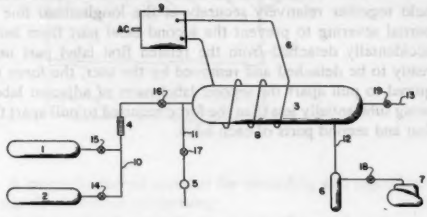
(a) introducing into a reaction zone a vaporized material consisting essentially of fragmentable fluorine-containing monomers;

(b) subjecting said fluorine-containing monomer to an electrical glow discharge, whereby there is formed a reactive species wherein said fluorine-containing monomer is perfluorocyclobutane and said reactive species is difluorocarbene;

(c) contacting in said reaction zone an organic substrate disposed in said zone with said reactive species; and

(d) depositing a thin, solid continuous fluorocarbon film on said substrate.

2. A method for reducing the coefficient of friction and increasing the hydrophobicity of the surfaces of inorganic substrates comprising



(a) disposing within a reaction zone at least one inorganic substrate;

(b) introducing into such reaction zone a vaporized material consisting essentially of fragmentable fluorine-containing monomer;

(c) subjecting said monomer to an electrical glow discharge, whereby there is formed a plasma comprising difluorocarbene reactive species;

(d) contacting said substrate in said reaction zone with said reactive species; and

(e) depositing a thin, solid continuous fluorocarbon film on said substrate.

4,188,427

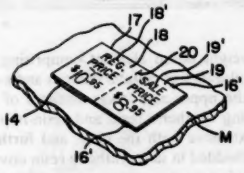
COMPOSITE WEB OF PRESSURE SENSITIVE LABELS

Joseph J. Grass, Kettering, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation of Ser. No. 758,296, Jan. 10, 1977, abandoned. This application Jan. 26, 1979, Ser. No. 6,608

Int. Cl.[2] **B32B** *3/10;* **A44C** *3/00*

U.S. Cl. 428—41 **8 Claims**



1. In a composite web of pressure sensitive labels adapted to be used in a hand-held label applying apparatus, the composite web including a longitudinally extending web of supporting material having a release coating, printable label material having pressure sensitive adhesive releasably adhering the label material to the release coating on the supporting material web, longitudinally spaced laterally extending lines of severing in the label material to provide a series of labels carried on the supporting material web, a longitudinally extending line of partial severing in the label material between the side edges of

the label material and providing each label with first and second label parts, only the first label parts having a coating of the adhesive with the adhesive on the first label parts being present in an amount and distribution to hold the labels securely to merchandise, and the second label parts being connected to the supporting material web only through the longitudinally extending line of partial severing, the improvement wherein each laterally extending line of severing is substantially continuous and extends substantially completely across the entire width of the label material but defines a frangible portion connecting together the second label parts of adjacent labels for keeping the second label parts close to the supporting material web but enabling a label which is to be applied to be readily pulled apart from the next adjacent label during application of a label without knife cutting, the first and second label parts being held together relatively securely at the longitudinal line of partial severing to prevent the second label part from being accidentally detached from the related first label part until ready to be detached and removed by the user, the force required to pull apart the second label parts of adjacent labels being substantially less than the force required to pull apart the first and second parts of each label.

4,188,428

BOARD ELEMENT

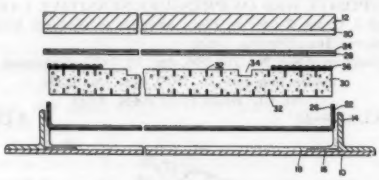
Peter Wolf, Am Galgenfeld 13, 6460 Gelnhausen, Fed. Rep. of Germany

Filed Mar. 24, 1978, Ser. No. 889,850

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1977, 2736842

Int. Cl.² B32B *3/00, 31/10*

U.S. Cl. 428—71 **9 Claims**



1. A lightweight board element comprising a lightweight core having a plurality of cellular cavities and a covering layer provided on the upper and lower surfaces of the core, said layer comprising synthetic resin and resin-impregnated glass fiber mat coextensive with the core, and further comprising wire fabric embedded in said synthetic resin covering layer for receiving fastening screws, said core comprising a rigid plastic foam board-like element having a first grid pattern of intersecting grooves on its upper surface and a second grid pattern of intersecting grooves on its lower surface, the first and second grid patterns being formed in the respective upper and lower surfaces of the core and being separated from one another, each of said first and second grid patterns being formed by a series of longitudinal and transverse grooves extending across the respective upper and lower surface of the core, each of said grooves having a width of about 1 to 3 mm, a depth of about 3–6 mm, and being separated by a distance of about 0.5 to 1.5 cm, said longitudinal and transverse grooves intersecting and forming said grid patterns.

4,188,429

PILE TEXTILE ELEMENTS WITH FUSED WRAPPER AND BASE

Daniel Braconnier, Ecully; Rene Guillermin, Bron, and Sylvio Sangalli, Caluire, all of France, assignors to Rhone-Poulenc-Textile, Lyons, France

Filed Jun. 14, 1978, Ser. No. 915,525

Claims priority, application France, Feb. 8, 1978, 78 03738

Int. Cl.² B32B *3/02*

U.S. Cl. 428—85 **22 Claims**

1. In a pile textile element for decorative pile articles comprising a bundle of a plurality of substantially parallel, heat-fusible filamentary textile materials and a removable wrapper encasing the bundle over at least a portion of its length, the improvement comprising:

(a) the wrapper comprised of heat-fusible material; and

(b) the heat-fusible filamentary textile materials at one end of said bundle being fused together with the heat-fusible wrapper to form a flat base.

4,188,430

MULTILEVEL COLORWAY CARPET SYSTEM

Lewis M. DeBernard, Jr., Richmond, and Donald G. Mercer, Chester, both of Va., assignors to Allied Chemical Corporation, Morris Township, N.J.

Continuation-in-part of Ser. No. 800,268, May 25, 1977, abandoned. This application Jun. 12, 1978, Ser. No. 914,452

Int. Cl.² B32B *3/02*

U.S. Cl. 428—88 **57 Claims**

1. A carpet selected from the group consisting of cut/loop and cut pile carpet having a beneath-the-surface patterning effect, said carpet comprising at least two yarn groups of differing characteristics said yarn groups comprising

(A) a multiple ply heat-set yarn having a relatively light dye affinity combined with a nonheat-set yarn having a first relatively darker dye affinity, and

(B) a heat-set yarn having a relatively light dye affinity combined with a nonheat-set yarn having a second relatively darker dye affinity,

so that said nonheat-set yarns shrink to a lower pile height in said carpet than said heat-set yarn due to the heat and moisture of dyeing and drying said carpet, whereby at least two colorways are established in said carpet pile.

4,188,431

LATENT IMAGE PRINTING AND DEVELOPMENT

Phillip E. Sokol, Rockville, and Robert F. Farmer, Gaithersburg, both of Md., assignors to The Gillette Company, Boston, Mass.

Filed Sep. 24, 1975, Ser. No. 616,197

Int. Cl.² D21H *5/10*; B44F *1/10*

U.S. Cl. 428—29 **5 Claims**

1. A reusable paper-based feedback system comprising a paper substrate having a water solubility acidity-alkalinity of from 0.08% acid as sulfur trioxide to 0.05% base as sodium hydroxide, said paper substrate bearing

a. a visible image and

b. an invisible image derived from printing on said paper

substrate an ink comprising from 0.1 to 9.0% by weight phenolphthalein.

4,188,432

ARTICLES RESISTANT TO ATTACK BY FATTY SUBSTANCES, MADE FROM POLYSTYRENE BLENDS, AND COMPOSITIONS

Geoffrey Holden, Houston, Tex., and Lam H. Gouw, Laren, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 30, 1978, Ser. No. 892,045

Int. Cl.[2] **B65D** *81/02;* **C08L** *53/02*

U.S. Cl. 428—35 **5 Claims**

1. An article resistant to attack by fatty substances, produced by extrusion or injection molding from a composition consisting essentially of

(A) 60 to 93 parts by weight, per 100 parts of the compositions, of a polystyrene component consisting of 100 to about 45% of a thermoplastic styrene-diolefin elastomer graft copolymer with 0 to about 55% of thermoplastic styrene homopolymer;

(B) 2 to 30 parts by weight, per 100 parts of the composition, of a polyolefin component selected from the group consisting of low density polyethylene, high density polyethylene and polypropylene and

(C) 5 to 20 parts by weight, per 100 parts of the composition, of a block copolymer X-Y-X where each X is a polystyrene block of about 5,000 to 10,000 molecular weight and Y is a hydrogenated polybutadiene block of about 25,000 to 50,000 molecular weight, the total molecular weight of the block copolymer being less than about 60,000.

said article being characterized by having a skin layer substantially enriched in polyolefin, which imparts resistance to fatty substances.

2. Extruded sheet according to claim 1.

3. Hollow articles produced from extruded sheet according to claim 2.

4,188,433

RECORD CARRIER IN DISK FORM HAVING COVER LAYERS

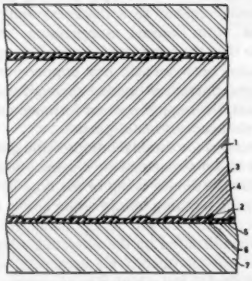
Rinse Dijkstra; Arnoldus J. M. van den Broek, and Gerardus J. M. Lippits, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 20, 1978, Ser. No. 926,953

Claims priority, application Netherlands, Dec. 12, 1977, 7713710

Int. Cl.[2] **G11B** *7/24;* **B32B** *27/08, 27/30*

U.S. Cl. 428—64 **4 Claims**



1. A disk shaped record carrier comprising a substrate, a radiation-reflecting layer of metal on said substrate containing at least one optically readable information path, a radiation-transparent cover plate of a thickness of 0.2–1 mm, formed of glass or a transparent synthetic resin material, covering said reflective metal layer and joined to said reflective metal layer by an ultraviolet curable lacquer composition layer of at most 30μ in thickness.

4,188,434

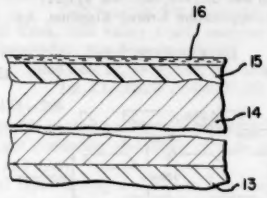
LUBRICANT FOR A MAGNETIC MEMBER

Thomas J. Loran, Boulder, Colo., assignor to Storage Technology Corporation, Boulder, Colo.

Filed May 15, 1978, Ser. No. 906,022

Int. Cl.[2] **H01F** *1/26;* **B32B** *27/28*

U.S. Cl. 428—65 **12 Claims**



1. A magnetic record member for recording and reproducing signals therefrom comprising:

a substrate of said magnetic record member; and

a smooth continuous layer of solid lubricant on said substrate, a smooth continuous layer of luquid lubricant on top of the layer of solid lubricant, each of said layers having a thickness of between 1/10 microinches and twenty microinches.

8. The method of lubricating a magnetic record member comprising:

providing a magnetic record member substrate;

dispersing solid lubricant in a carrier;

dispersing liquid lubricant in a carrier; and

spraying said solid lubricant, and said liquid lubricant, and their carrier onto said substrate in separate layers with the liquid lubricant on top of a layer of solid lubricant on said substrate, the thickness of each of said layers being between 1/10 microinches and twenty microinches.

4,188,435

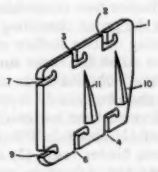
LOST END RETHREAD CLIP

Norman G. Bartrug, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 29, 1979, Ser. No. 7,081

Int. Cl.[2] **B32B** *3/30;* **B65H** *57/00*

U.S. Cl. 428—167 **5 Claims**



1. A clip for rethreading a broken strand from a group of parallel strands being passed through a process wherein the strands are maintained in spaced parallel relationship during their passage through the process comprising a generally flat body provided with a series of slots on its upper and lower ends; the slots being aligned with each other and adapted to engage strands placed therein, an external rib for each set of slots provided on the external surface of said body and on each side thereof, said ribs being raised from the surface of said body a sufficient distance to enable them to run in a pulley channel when passed into it, a set of parallel slots on one side of said

body located near the top and bottom of said body and each of these slots being aligned with the slots provided on the upper and lower end of said body.

4,188,436

NON WOVEN FABRICS WITH PATTERN OF DISCRETE FUSED AREAS

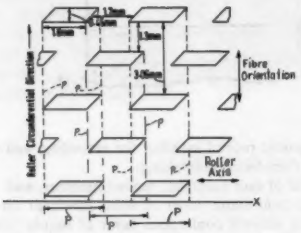
Peter M. Ellis, and Alan Selwood, both of Harrogate, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jul. 3, 1978, Ser. No. 921,517

Claims priority, application United Kingdom, Apr. 8, 1976, 14360/76

Int. Cl.[2] B32B *7/14*

U.S. Cl. 428—198 **13 Claims**



1. Non-woven fabric comprising at least two layers of fibres bonded in a pattern of discrete fused areas, wherein the fibres in at least the outer layers exhibit a predominating direction of orientation and at least one layer includes or consists of fibres having an orientation orthogonal to the predominating direction of orientation in the outer layer or layers and the maximum distance between bonded areas at at least one surface measured in the direction of fibre orientation is not more than 10 mm and the bonded areas are so arranged that a projection of the bonded areas within this maximum distance, in the direction of fibre orientation, onto a line perpendicular to the predominating direction of fibre orientation is continuous.

4,188,437

THERMOTROPIC ADHESIVE TAPE

Stanley E. Rohowetz, Barrington, Ill., assignor to American Can Company, Greenwich, Conn.

Filed May 25, 1978, Ser. No. 909,481

Int. Cl.[2] B32B *3/14*; G01K *11/12*

U.S. Cl. 428—199 **22 Claims**

1. A thermotropic adhesive tape comprising a base layer of a material selected from the group consisting of polymers and metals, an adhesive coating on one surface of said base layer, and colored markings on either the outer surface of said base layer or the surface of said adhesive layer adjacent said base layer so as to be visible thereon;

said markings being formed from an ink composition comprising a solution of (1) about 3–30% by weight of an alcohol-soluble resole binder resin; (2) about 0.1–5% by weight of a colorant selected from the group consisting of (a) a reactive thermotropic dye capable of exhibiting a visible color change upon exposure to steam at a temperature of at least about 215° F. and (b) a combination of dyes of different color capable of exhibiting a visible color change upon exposure to water or steam at a temperature of at least about 120° F., said dye combination including at least one dye which is water-extractible at said temperature and at least one other dye which is not water-extractible at said temperature; (3) about 65–97% by weight of a solvent blend consisting essentially of (a) about 25–75% of an aliphatic alcohol having 1 to 3 carbon atoms or a mixture thereof and (b) about 25–75% of an organic compound selected from the group consisting of aliphatic and cyclic ketones, aldehydes, acetals, ethers and esters; and (4) about 0.01–0.1% of a surfactant;

said ink composition being disposed on the outer surface of said base layer when said base layer is a metallic material and also being disposed on said base layer when said ink composition comprises said combination of dyes, said ink composition being adhered to said base layer when said base layer comprises a polymeric material by softening and swelling the surfaces of the polymer to allow penetration of the ink; said composition being capable of undergoing a visible and permanent color change as seen on said base layer upon exposure to water at a temperature sufficient to activate a change in color of the colorant.

4,188,438

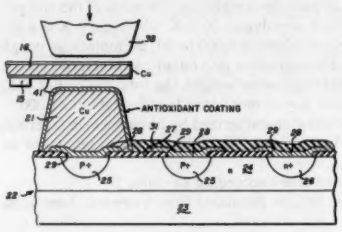
ANTIOXIDANT COATING OF COPPER PARTS FOR THERMAL COMPRESSION GANG BONDING OF SEMICONDUCTIVE DEVICES

Carmen D. Burns, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 2, 1975, Ser. No. 582,634

Int. Cl.[2] B32B *3/10*; H01L *21/02, 21/60*

U.S. Cl. 428—209 **17 Claims**



1. In a method for thermal compression gang bonding of lead structures to be connected to a semiconductive device, such semiconductive device being of a type having a plurality of metallic gang bonding bumps rising above the surface of the semiconductive device and being connected at their bases to underlying patterns of metallization on the semiconductive device, and wherein at least one copper portion operatively associated with the semiconductive device is to be thermal compression gang bonded to a second metal portion operatively associated with the semiconductive device, the steps of:

coating said first copper portion with an antioxidant coating to inhibit oxidation of the copper portion, such antioxidant coating being applied to a thickness and of a material compatible with thermal compression bonding therethrough so that the completed thermal compression bond to be effected between said first copper portion and said second metal portion is bonded through said antioxidant coating, said first copper portion forming a bonding interface with said second metal portion.

12. In an apparatus for thermal compression gang bonding of lead structures to be connected to a semiconductive device, such semiconductive device being of the type having a plurality of metallic gang bonding bumps rising above the surface of the semiconductive device and being connected at their bases to patterns of metallization on the semiconductive device:

a first copper portion operatively associated with the semiconductive device and which is to be thermal compression gang bonded to a second metal portion operatively associated with the semiconductive device;

said first copper portion having an antioxidant coating thereon to inhibit oxidation of said copper portion, such antioxidant coating being of a thickness and of a material compatible with thermal compression bonding therethrough so that the completed thermal compression bond

to be effected between said first copper portion and the second metal portion is bonded through said antioxidant coating with said first copper portion forming a bonding interface with said second metal portion.

4,188,439

ADHESIVE TAPE

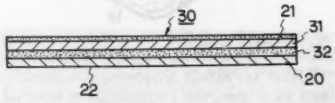
Hiroshi Asakura; Ippei Chimura; Keisuke Kitazume; Yoshiyuki Kaneko; Shirou Fuse, and Akio Ueno, all of Kamakura, Japan, assignors to Toyo Kagaku Kabushiki Kaisha, Kanagawa, Japan

Division of Ser. No. 850,218, Nov. 10, 1977. This application Jun. 30, 1978, Ser. No. 920,688

Claims priority, application Japan, Dec. 28, 1976, 51-157575; Apr. 30, 1977, 52-49077

Int. Cl.[2] B32B *7/02*

U.S. Cl. 428—215 **6 Claims**



1. An adhesive tape comprising a base paper material having a thickness of 30 to 150 g/m^2, a film of high density polyethylene having a density of not less than 0.94 g/cc elongated to sixteen times only transversely to the longitudinal direction of the tape and having a thickness of 15 to 30μ, said elongated film being attached to one side of said base paper material with a layer of low density polyethylene being extruded between the base paper material and the elongated film, and a layer of pressure sensitive adhesive adhesive applied to the other side of said base paper material.

4,188,440

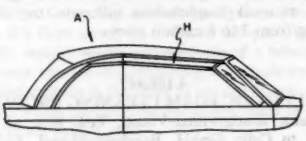
SELF-SUPPORTING AUTOMOTIVE LINER PANEL

Richard P. Doerer, Grosse Pointe, Mich., assignor to Van Dresser Corporation, Troy, Mich.

Continuation-in-part of Ser. No. 886,137, Mar. 13, 1978, which is a continuation-in-part of Ser. No. 592,611, Jul. 2, 1975, abandoned. This application Jan. 24, 1979, Ser. No. 5,956

Int. Cl.[2] B32B *3/26, 5/14, 5/20*

U.S. Cl. 428—215 **9 Claims**



1. A laminated self-supporting, automotive liner panel of predetermined contour consisting of an outer substrate layer of a heat resistant, expanded styrene copolymer formed by the copolymerization of styrene and maleic anhydride which is relatively rigid and has a substantial resistance to bending, an intermediate layer of relatively soft, compressible, flexible urethane foam bonded to one side of said substrate layer in direct surface-to-surface contact therewith, said intermediate layer being of sufficient thickness to provide heat and sound insulation, to provide a soft feel and to conceal imperfections in said substrate layer, and an outer flexible decorative finish cover layer bonded to the side of said intermediate layer opposite said substrate layer in direct surface-to-surface contact therewith.

2. The automotive liner panel defined in claim 1, wherein said copolymer contains about 6%–20% by weight of maleic anhydride.

5. The automotive liner panel defined in claim 2, wherein said substrate layer has a thickness of 0.150"–0.180" and a density of 4 pounds per square foot, and said intermediate layer has a thickness of 0.060"–0.500" and a density of 1 to 4 pounds per cubic foot.

7. The automotive liner panel defined in claim 5, wherein said cover layer is a vinyl skin having a thickness of 0.005"–0.010".

4,188,441

FLEXIBLE PACKAGING FILMS OF HIGH DENSITY POLYETHYLENE CAPABLE OF FORMING EASILY OPENABLE HEATSEALS

Stephen O. Cook, Mill Valley, Calif., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Feb. 17, 1976, Ser. No. 658,549

Int. Cl.[2] B32B *27/08, 27/32*

U.S. Cl. 428—216 **9 Claims**

1. A flexible packaging film comprising a

base layer consisting essentially of high density polyethylene, and a

heatseal layer having a thickness between about 0.25 and 0.75 mil and consisting essentially of a physical blend of a first and second copolymer,

the first copolymer being a copolymer of ethylene and a comonomer selected from the group consisting of vinyl acetate, methyl acrylate, ethyl acrylate, methyl methacrylate, and ethyl methacrylate, the comonomer content being between 10 and 30 mole percent,

the second copolymer in the blend being an ionomer which is a copolymer of at least 50 mole percent of an olefin having up to 9 carbon atoms and an ethylenically unsaturated monocarboxylic acid wherein at least 10% of the carboxylic acid groups are neutralized by an alkali metal ion,

the ratio of the first copolymer to the second copolymer (ionomer) being between 40:60 and 80:20,

the film being formed by coextruding the base layer and the heatseal layer adjacent to each other,

the film being capable of forming a blend-to-blend heatseal by the application of a pressure of 20 psi for one second at a film temperature of less than 245° F., which heatseal is openable by rupture of the heatseal layer and delamination between the base layer and the heatseal layer by the application of a force between one and five pounds per inch width, but not openable by the application of a force of one pound per inch width or less, the heatseal having a peel strength of at least 0.3 pounds per inch width,

the heatseal layer having a tack strength at a temperature at which a heatseal can be formed which is sufficient to maintain the seal without application of pressure until the seal has cooled.

4,188,442

ADHESIVE TAPE

Hiroshi Asakura; Ippei Chimura; Keisuke Kitazume; Yoshiyuki Kaneko; Shirou Fuse, and Akio Ueno, all of Kamakura, Japan, assignors to Toyo Kagaku Kabushiki Kaisha, Kamakura, Japan

Continuation-in-part of Ser. No. 850,218, Nov. 10, 1977. This application Jun. 30, 1978, Ser. No. 920,648

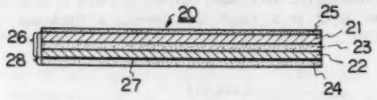
Claims priority, application Japan, Dec. 28, 1976, 51-157575; Apr. 30, 1977, 52-49077

Int. Cl.[2] B32B *7/02*

U.S. Cl. 428—216 **6 Claims**

1. An adhesive tape comprising a base paper material having a thickness of 30 to 150 g/m^2, a film of high density polyethylene having a density of not less than 0.94 g/cc elongated six to sixteen times only transversely to the longitudinal direction of the tape and having a thickness of 15 to 30μ, said elongated film being attached to one side of said base paper material with a first layer of low density polyethylene of a thickness of 7 to

50μ being extruded between the base paper material and the elongated film, a second layer of low density polyethylene of thickness of 7 to 50μ being extruded and attached to said



elongated film so that the elongated film is sandwiched between the first and second layers of low density polyethylene, and a layer of pressure sensitive adhesive applied to the other side of said base paper material.

4,188,443

MULTI-LAYER POLYESTER/POLYOLEFIN SHRINK FILM

Walter B. Mueller, Taylors; Henry G. Schirmer, Spartanburg; Julian H. Schoenberg, and Alan S. Weinberg, both of Greenville, all of S.C., assignors to W. R. Grace & Co., Duncan, S.C.

Filed Aug. 30, 1978, Ser. No. 938,191

Int. Cl.[2] B65D *65/02;* **B32B** *31/28, 27/36, 27/32*

U.S. Cl. 428—216 **11 Claims**

1. A heat shrinkable, multi-layer, flexible, thermoplastic packaging film comprising:

(a) at least three layers of polymeric material;

(b) at least one of said layers being an inner layer and comprising a polymer selected from the group consisting of: (i) homopolymers, copolymers, and terpolymers of ethylene and (ii) blends of ethylene homopolymers or copolymers with butylene homopolymers or copolymers, said inner layer comprising 50% to 90% of the total thickness of said laminate;

(c) another of said layers comprising a polymer selected from the group consisting of polyesters and copolyesters, said layer being stretch oriented;

(d) said multi-layer film having shrink tension in the range from 100 to about 400 p.s.i.; and,

(e) said film having a total thickness in the range between 0.1 mil and 2.0 mil.

4,188,444

METHOD OF COATING GLASS AND GLASS COATED THEREBY

Manfred Landau, Southport, England, assignor to Pilkington Brothers Limited, St. Helens, England

Filed Feb. 23, 1978, Ser. No. 880,430

Claims priority, application United Kingdom, Mar. 1, 1977, 8641/77

Int. Cl.[2] C03C *17/30*

U.S. Cl. 428—428 **19 Claims**

1. In a method of coating glass with a silicon-containing coating, comprising moving the glass past a coating station while the temperature of the glass is at least 400° C., and releasing silane-containing gas close to the glass surface at a substantially constant pressure across the glass surface and under non-oxidising conditions so that the silane pyrolyses to deposit a silicon-containing coating on the glass surface, the improvement comprising including in the silane-containing gas a proportion of a gaseous electron-donating compound selected from the group consisting of olefin compounds, acetylenic hydrocarbons, aromatic hydrocarbons and ammonia, said compound imparting a predetermined alkali resistance to the silicon-containing coating.

16. Glass coated with a silicon-containing coating according to the method of claim 1, wherein the silicon-containing coating has a refractive index in the range 2.5 to 3.5, and has an alkali-resistance such that it shows no sign of damage to the unaided eye after immersion in 1 Normal sodium hydroxide at 90° C. for at least 60 seconds.

4,188,445

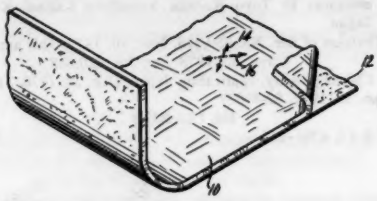
LAMINATED FABRIC OF POLYPROPYLENE

Philip R. Hill, Nuremberg, Pa., assignor to Chromatex, Inc., W. Hazeltine, Pa.

Continuation of Ser. No. 859,851, Dec. 12, 1977, abandoned. This application Dec. 21, 1978, Ser. No. 971,804

Int. Cl.[2] B32B *7/00*

U.S. Cl. 428—246 **7 Claims**



5. A laminated fabric formed by the process of bonding a pre-formed layer of woven polypropylene yarns to a pre-formed layer of non-woven polypropylene material using a solvent-based adhesive at a temperature less than 200° F. to produce a unitary fabric structure having greater strength and stability characteristics than the layer of woven polypropylene yarns without shrinkage or distortion of the characteristics of the polypropylene yarns.

4,188,446

PAPER HAVING IMPROVED STRENGTH

Norman J. Friedman, Monmouth Junction, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Continuation of Ser. No. 793,676, May 4, 1977, abandoned. This application Apr. 25, 1978, Ser. No. 900,042

Int. Cl.[2] D04H *1/58*

U.S. Cl. 428—288 **6 Claims**

1. A non-woven sheet material suitable for use in disposable garments, said sheet material comprising:

(a) cellulosic paper-making fibers;

(b) a cross-linked ethylene/vinyl acetate latex polymer binder; and

(c) in an amount sufficient to increase the strength of said sheet material, as measured by at least one of tensile strength, tear strength, or Mullen burst strength, an alkali metal monoalkylnaphthalene sulfonate, the alkyl group having from 3 to 8 carbon atoms.

4,188,447

POLYMERIC FOAM CLEANING PRODUCT

Peter Ehlenz, Konigswinter-Vinxel, Fed. Rep. of Germany, assignor to Collo GmbH, Bornheim-Hersel, Fed. Rep. of Germany

Filed Jul. 20, 1977, Ser. No. 817,262

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1976, 2632545

Int. Cl.[2] B32B *3/26*

U.S. Cl. 428—310 **6 Claims**

1. A sustained release cleaning product for the controlled release of a surfactant comprising active substance depots which are porous particles with at least one absorbed surfactant, said porous particles being coated with a thin protective powder coating, said active substance depots being dispersed in a polymeric foam, said protective powder coating comprising powders of inorganic materials selected from the group consisting of sodium chloride, sodium sulfate and ammonium chloride.

4. A sustained release cleaning composition for the controlled release of a surfactant comprising a mixture of a flexible polyurethane adhesive having dispersed therein active substance depots, said depots comprising porous particles with at

least one absorbed surfactant, said porous particles being coated with a thin protective powder coating of a substance selected from the group consisting of sodium chloride, sodium sulfate, ammonium chloride, and silica, said composition being coated on a substrate selected from the group consisting of polymer films, paper, fabric, fleeces and foams.

4,188,448

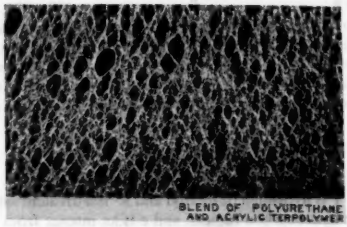
STEREO RETICULATED POLYMERIC LACE-LIKE STRUCTURE AND PROCESS FOR MAKING THE SAME

Paul T. Stricharczuk, Solon, and Dennis L. Lawson, Brunswick, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 659,412, Feb. 19, 1976, Pat. No. 4,062,915. This application Jun. 30, 1977, Ser. No. 812,024

Int. Cl.[2] B32B *3/26, 5/18*

U.S. Cl. 428—311 **6 Claims**



1. A stereo reticulated lace-like structure formed from a polymeric blend of (A) a polyurethane substantially free of cross-links made by the reaction of (1) an essentially linear hydroxyl terminated polyester made by the reaction of a dicarboxylic acid having the formula HOOC—R—COOH wherein R is an alkylene radical containing 2 to 8 carbon atoms with a glycol having the formula $HO(CH_2)_xOH$ wherein x is a number from 4 to 8; (2) a free glycol containing from 4 to 10 carbon atoms; and (3) a diphenyl diisocyanate, (B) an acrylic polymer comprising in 100 weight parts of polymer from about 40 to 97 weight parts of a lower acrylic acid ester, from 0 to 45 weight parts of a methacrylic acid ester, and from about 3 to 15 weight parts of an α,β-olefinically unsaturated carboxylic acid having a terminal $CH_2{=}C<$ group and containing from 3 to 4 carbon atoms, and (C) from about 0.1 to about 3.0 parts by weight, based on the weight of the polyurethane of a lubricant, said structure being non-woven containing a multiplicity of overlapping oriented fibrils in the plane of the non-woven structure and having a single ply basis weight in the range of about 0.2 to 4.0 ounces per square yard.

4,188,449

PHOSPHORESCENT SCREENS

Chen-i Lu, Rochester; Harry J. Krall, Webster, and Herman R. Osmers, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 4, 1977, Ser. No. 821,875

Int. Cl.[2] B05B *5/00;* **D06L** *3/12*

U.S. Cl. 428—314 **35 Claims**

1. A phosphorescent screen comprising a support and a layer of finely-divided particles of a phosphor dispersed in a cross-linked, void-containing polymeric matrix, said layer having been formed by:

(1) coating said support with a radiation-curable composition comprising a suspension of said finely-divided phosphor particles in a viscous liquid composition, said viscous liquid composition comprising a first component that is capable of being radiation-cured to form a cross-linked polymeric matrix surrounding said phosphor particles and a second component that is capable of being evaporated to generate voids within said matrix,

(2) irradiating said coating to cure said first component and form thereby a cross-linked polymeric matrix surrounding said phosphor particles, and

(3) evaporating said second component simultaneously with or subsequent to said irradiating to thereby generate voids within said matrix.

4,188,450

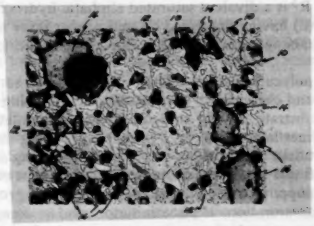
SHELL INVESTMENT MOLDS EMBODYING A METASTABLE MULLITE PHASE IN ITS PHYSICAL STRUCTURE

Charles D. Greskovich, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 23, 1976, Ser. No. 698,909

Int. Cl.[2] B22C *13/08;* **B28B** *7/34, 7/36*

U.S. Cl. 428—329 **18 Claims**



1. A shell investment mold suitable for the casting and directional solidification of superalloys therein comprising

a ceramic material formed in situ as a reaction product of the chemical reaction between a mixture of alumina and a silica binder material which produces two solid phases consisting of mullite and unreacted alumina,

the reaction product has a microstructure which exhibits irregular shaped alumina particles disposed in a mixture of a mullite phase and an alumina liquid phase when the alumina-silica mixture is fired at about 1725° C. for up to 2 hours,

the composition of the alumina-silica material mixture when dried, and before firing, being from 80 to 90 weight percent alumina, the balance silica,

the average particle size of the alumina in the mixture is less than 100 microns, and

the average particle size of the silica in the mixture is less than 1000 A.

4,188,451

POLYCARBONATE ARTICLE COATED WITH AN ADHERENT, DURABLE, SILICA FILLED ORGANOPOLYSILOXANE COATING AND PROCESS FOR PRODUCING SAME

James S. Humphrey, Jr., Clemmons, N.C., assignor to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 895,790, Apr. 4, 1978, abandoned. This application Feb. 15, 1979, Ser. No. 12,579

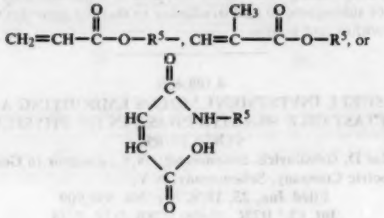
Int. Cl.[2] B32B *27/30, 27/08;* **G02B** *1/08*

U.S. Cl. 428—331 **43 Claims**

1. A polycarbonate article having improved scratch, mar, abrasion and chemical solvent resistance comprising a polycarbonate substrate having deposited thereon: (i) an ultraviolet radiation cured primer layer which contains the photoreaction products of (a) at least one polyfunctional acrylic acid ester monomer, and (b) at least one organic silicon compound represented by the general formula

$$R^4_cSiX_{4-c}$$

wherein c is an integer from 1 to 3 inclusive, X is an alkoxy, acyloxy or aryloxy radical, and R^4 represents a radical selected from



wherein R^5 is a divalent saturated aliphatic hydrocarbon radical; and (ii) having deposited on said primer layer a cured top coat containing a colloidal silica filled thermost organopolysiloxane.

16. A polycarbonate article having improved scratch, mar, abrasion and chemical solvent resistance comprising a polycarbonate substrate having thereon (i) an ultraviolet radiation cured primer layer, said cured primer layer being the photoreaction product of a primer composition containing at least one polyfunctional acrylic acid ester monomer, at least one organic silicon compound containing at least one organic group having olefinic unsaturation, a photoinitiator, and a compound selected from resorcinol monobenzoate, lower alkyl substituted resorcinol monobenzoate, or mixtures thereof; and (ii) a cured colloidal silica filled thermoset organopolysiloxane top coat on said cured primer layer, said top coat being the thermally cured product of a top coat composition comprising a dispersion of colloidal silica in a lower aliphatic alcohol-water solution of the partial condensate of a silanol of the formula $R^6Si(OH)_3$ wherein R^6 is selected from the group consisting of alkyl radicals containing 1 to 3 carbon atoms, the vinyl radical, the 3,3,3-trifluoropropyl radical, the gamma-glycidoxypropyl radical and the gamma-methacryloxypropyl radical, at least 70 weight percent of the silanol being $CH_3Si(OH)_3$, said composition containing sufficient acid to provide a pH in the range of 3.0 to 6.0.

25. A process for producing a mar, abrasion, scratch and chemical solvent resistant polycarbonate article comprising the steps of:

(i) applying onto the polycarbonate an ultraviolet radiation curable primer composition containing (a) at least one polyfunctional acrylic acid ester monomer, (b) at least one organic silicon compound containing at least one organic group having olefinic unsaturation, (c) resorcinol monobenzoate, alkyl substituted resorcinol monobenzoate, or mixtures thereof, and (d) a photo-initiator;

(ii) curing said primer composition by exposure to ultraviolet radiation to form a cured primer layer;

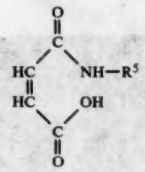
(iii) applying onto said cured primer layer a silica filled further curable organopolysiloxane top coat composition comprising a dispersion of colloidal silica in a lower aliphatic-water solution of the partial condensate of a silanol of the formula $R^6Si(OH)_3$ wherein R^6 is selected from the group consisting of an alkyl radical containing 1 to 3 carbon atoms, the vinyl radical, the 3,3,3-trifluoropropyl radical, the gamma-glycidoxypropyl radical and the gamma-methacryloxypropyl radical, at least 70 weight percent of said silanol being $CH_3Si(OH)_3$, said composition containing sufficient acid to provide a pH in the range of 3.0 to 6.0;

(iv) evaporating the volatile solvents from said composition; and,

(v) applying heat to said composition to cure said composition, whereby said silanol is condensed further to a silsesquioxane.

34. A polycarbonate article having improved scratch, mar, abrasion and chemical solvent resistance comprising a polycarbonate substrate having thereon (i) an ultraviolet radiation cured primer layer, said cured primer layer being the photoreaction product of a primer composition containing at least one polyfunctional acrylic acid ester monomer; at least one organic silicone compound containing at least one organic group having olefinic unsaturation and represented by the general formula $R^4_cSiX_{4-c}$ wherein X represents an alkoxy, acyloxy or aryloxy radical, R^4 represent a compound represented by the formula

and



wherein Y is hydrogen or methyl and R^5 is a divalent saturated aliphatic hydrocarbon radical, and c is an integer from 1 to 3, a photoinitiator, and a compound selected from resorcinol monobenzoate, lower alkyl substituted resorcinol monobenzoate, or mixtures thereof; and, (ii) a cured colloidal silica filled thermoset organopolysiloxane top coat on said cured primer layer, said top coat being the thermally cured product of a top coat composition comprising a dispersion of colloidal silica in a lower aliphatic alcohol-water solution of the partial condensate of a silanol of the formula $R^6Si(OH)_3$ wherein R^6 is selected from the group consisting of alkyl radicals containing 1 to 3 carbon atoms, the vinyl radical, the 3,3,3-trifluoropropyl radical, the gamma-glycidoxypropyl radical and the gamma-methacryloxypropyl radical, at least 70 weight percent of the silanol being $CH_3Si(OH)_3$, said composition containing sufficient acid to provide a pH in the range of 3.0 to 6.0.

4,188,452

HEAT-REFLECTING GLASS PANE

Rolf Groth, Bochum-Wattenscheid, Fed. Rep. of Germany, assignor to BFG Glassgroup, Paris, France

Filed Oct. 6, 1977, Ser. No. 839,938

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1976, 2646513

Int. Cl.[2] **G02B** *27/00;* **B32B** *9/04*

U.S. Cl. 428—336 **7 Claims**

1. A heat reflecting pane comprising a substantially transparent glass substrate, a layer of silicon oxide on the glass substrate, the thickness of said silicon oxide layer being such that interference effects are not caused thereby, and a layer of TiO_2 on the side of the layer of silicon oxide remote from said glass substrate, said layer of TiO_2 being at least predominantly in the rutile form and having been formed by applying a Ti layer to said silicon oxide layer by vapor deposition in vacuo and subsequently oxidizing said Ti layer at a temperature of at least 400° C.

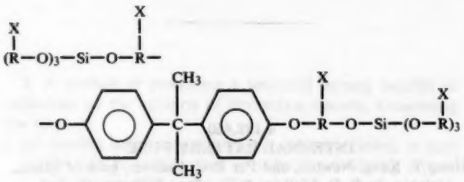
4,188,453
Patent Not Issued For This Number

4,188,454
ORGANO SILANE COUPLING AGENTS OVERCOATED ON ALUMINUM SILICATE COATING ON GLASS FIBERS

Kevin M. Foley, Toledo, and Homer G. Hill, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

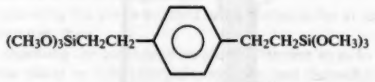
Continuation of Ser. No. 612,077, Sep. 10, 1975, abandoned, which is a continuation-in-part of Ser. No. 473,102, May 24, 1974, abandoned. This application Feb. 13, 1978, Ser. No. 877,201
Int. Cl.[2] B32B *9/00*
U.S. Cl. 428—391 **9 Claims**

1. A cementitious product comprising: a composite of reinforcing materials and a cementitious matrix wherein one of the reinforcement materials is glass fibers having on their surfaces a uniform coating of organo silanes, containing at least two hydrolyzable silane groups represented by the formula:



wherein each R is an alkyl radical having 1 to 10 carbon atoms and each X is hydrogen, chlorine, bromine, fluorine, or iodine, and a coating of aluminum silicate between the organo silane coating and the cementitious matrix.

8. A cementitious product comprising: a composite of reinforcing materials and a cementitious matrix wherein one of the reinforcement materials is glass fibers having on their surfaces a uniform coating of an organo silane having the following formula:



and a coating of aluminum silicate between the organo silane coating and the cementitious matrix.

4,188,455
ACTINIC RADIATION-CURABLE FORMULATIONS CONTAINING AT LEAST ONE UNSATURATED POLYETHER-ESTERURETHANE OLIGOMER

Dennis D. Howard, Girard, Pa., assignor to Lord Corporation, Erie, Pa.

Continuation-in-part of Ser. No. 866,575, Jan. 3, 1978, Pat. No. 4,133,723. This application Jan. 9, 1979, Ser. No. 2,114
Int. Cl.[2] C08G *18/00, 63/00*
U.S. Cl. 428—423.1 **12 Claims**

1. A coating composition comprising
(a) at least one unsaturated resin comprising the reaction product of
(i) at least one organic isocyanate compound having at least two isocyanate groups;
(ii) at least one polyetherester polyol having at least two hydroxy groups and having the residue of at least one poly(alkylene oxide) polyol integrated into the backbone chain of such polyetherester polyol; and
(iii) at least one unsaturated addition-polymerizable monomeric compound having a single isocyanate-functional active hydrogen group;
there being present an excess of isocyanate compound with respect to the hydroxy groups of said polyetherester polyol;
said unsaturated addition-polymerizable monomeric compound having a single isocyanate-reactive hydrogen group being present in an amount sufficient to provide at least one molar equivalent of active hydrogen group with respect to isocyanate reactivity;
(b) a reactive diluent system comprising at least one unsaturated addition-polymerizable monomeric compound which is copolymerizable with said unsaturated urethane resin;
the amount of unsaturated urethane resin being in the range from about 30 to about 90 weight percent, based on total weight of unsaturated urethane resin and reactive diluent systems; and
(c) a photocatalyst system selected from the group consisting of
(i) at least one compound which promotes free radical addition polymerization through bimolecular photochemical reactions of the energy donor or energy transfer type, of the hydrogen abstraction type, or by the formation of a donor-acceptor complex with monomers or additives leading to ionic or radical species; and
(ii) at least one compound which promotes free radical addition polymerization through bimolecular photochemical reactions of the energy donor or energy transfer type, of the hydrogen abstraction type, or by the formation of a donor-acceptor complex with monomers or additives leading to ionic or radical species in association with at least one compound which promotes free radical addition polymerization by generating reactive specie by way of unimolecular homolysis.

4,188,456
PRESSURE-SENSITIVE RECORDING SHEET

Rashmikant R. Patel, Appleton, Wis., assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 23, 1977, Ser. No. 863,949
Int. Cl.[2] B32B *27/10, 27/42;* **B41M** *5/16*
U.S. Cl. 428—530 **12 Claims**

6. A pressure-sensitive record sheet material comprising a supporting web material having adhesively bound on the surface thereof a coating composition comprising a zinc-modified para-alkylphenol formaldehyde resin in which the alkyl moiety is selected from the group consisting of octyl and nonyl and about 0.5 to 6 parts by dry weight per 100 parts by dry weight of the composition of a metallic compound selected from the group consisting of calcium oxide, calcium hydroxide, and magnesium oxide, said resin and metallic compound combining to produce a color response when contacted with a color-producing material.

4,188,457

CLOSURES FOR LIQUID PRODUCT CONTAINERS

Arnold M. Throp, Harrow, England, assignor to Metal Box Limited, Reading, England

Filed Apr. 14, 1977, Ser. No. 787,630
Claims priority, application United Kingdom, Apr. 29, 1976, 17415/76
Int. Cl.[2] A23L 3/34
U.S. Cl. 428—542 22 Claims

1. In a closure for a container of a wine or a wine-based product, at least a part of said closure intended to contact the product being in the form of a moulded stopper of a thermoplastics material having a foamed core within a liquid-impervious skin, the improvement comprising the feature that the foamed core has been produced by blowing the thermoplastics material with a blowing agent including a thermally decomposable metabisulphite and a water-producing compound, whereby said foamed core contains sulphur dioxide and water enabling the sulphur dioxide to act as an oxygen scavenger.

4,188,458

PROTECTIVE COATING ON A STEEL SURFACE

Evald Hugosson, Sankt Olof, and Anders Kullendorf, Finspong, both of Sweden, assignors to Stal-Laval Turbin AB, Sweden

Filed Apr. 6, 1977, Ser. No. 785,155
Claims priority, application Sweden, Apr. 8, 1976, 7604116
Int. Cl.[2] B32B 15/18
U.S. Cl. 428—556 25 Claims

1. A steel surface coated with a protective coating which comprises at least three adjacent metallic layers of substantially increasing normal potential under the expected conditions of use in the presence of hot moist steam wherein the normal potential of the base layer adjacent the steel surface is the lowest of the three metallic layers and the normal potential of that layer located farthest from the steel surface of said at least three metallic layers is the highest of the three metallic layers; and wherein the base layer lying on the steel surface has approximately the same normal potential as does the steel surface, and wherein said base layer is at least one member selected from the group consisting of nickel-aluminum alloy, nickel, and molybdenum.

4,188,459

CORROSION RESISTANT PLATING AND METHOD UTILIZING ALLOYS HAVING MICRO-THROWING POWER

Jacob Hyner, Waterbury; Steven Gradowski, Torrington, and Thomas F. Maestrone, East Hartford, all of Conn., assignors to Whyco Chromium Company, Inc., Thomaston, Conn.

Filed Sep. 27, 1978, Ser. No. 946,396
Int. Cl.[2] B32B 15/00, 15/18
U.S. Cl. 428—648 11 Claims

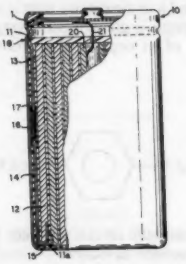
1. A multi-layer plating for providing improved corrosion resistance to a ferrous metal substrate comprising, in sequence:
(a) a layer of an alloy having micro-throwing power,
(b) a layer of a galvanically protective metal which is selected from the group consisting of cadmium, cadmium-tin alloy, a dual layer of cadmium and tin, zinc or zinc alloy,
(c) a layer of copper,
(d) a layer of nickel, and
(e) a layer of chromium or a metallic chromium substitute selected from the group consisting of a ternary alloy comprising cobalt, tin and a third metal selected from antimony, zinc or a metal of Periodic Group III_A or VI_B, and a binary alloy comprising cobalt or tin.

4,188,460

INTERNAL BATTERY FUSE

Hong Y. Kang, Newton, and Per Bro, Andover, both of Mass., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed May 1, 1978, Ser. No. 901,404
Int. Cl.[2] H01M 2/34
U.S. Cl. 429—7 7 Claims



1. An electrochemical cell comprising a container containing a first electrode, a second electrode, liquid electrolyte and one or more current collectors electrically connected to at least one of said electrodes with said current collector electrically engaged with a section of said container characterized in that a portion of said current collector between said electrical connection and electrical engagement is enclosed by thermal shielding means and said enclosed portion is immersed in said electrolyte whereby excessive heat generated by ohmic dissipation within said current collector caused by a short circuit of said cell is retained within said enclosed portion to fuse said portion and interrupt the circuit.

4,188,461

LEAD-ACID BATTERIES

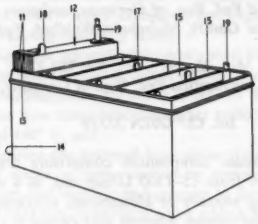
John A. Bant, Solihull, and Victor J. Raban, Birmingham, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Jan. 12, 1978, Ser. No. 868,784

Claims priority, application United Kingdom, Jan. 20, 1977, 2333/77

Int. Cl.[2] H01M *10/06, 10/44*

U.S. Cl. 429—48 10 Claims



1. A method of producing a lead-acid battery capable of activation by the addition of electrolyte thereto, comprising the steps of:

(a) starting with battery container accommodating at least one pack of battery plate grids having insulating separators interposed between adjacent grids, each of said grids carrying the lead-acid battery paste required to produce a positive or a negative battery plate after conversion of the paste into the active material of the plate,

(b) with the grids immersed in an aqueous solution of sulphuric acid, passing an eletric current between the grids so that the solution rises to a temperature in excess of 180° F. but not greater than 210° F., the passage of the electric current converting the paste on the grids to the active matrial of the plates,

(c) ceasing the passage of the electric current when sufficient of the paste has been converted to provide the plates with a charge in excess of 50% of the charge present when the battery is fully charged, then

(d) allowing the plates to stand in said solution for at least 15 minutes, then

(e) repeating the passage of an electric current so as to bring the plates to fully charged condition, and thereafter

(f) draining the sulphuric acid solution from the plates and then sealing the container against the ingress of air.

8. A lead-acid battery capable of storage by the addition of electrolyte thereto produced by a method as claimed in claim 1.

4,188,462

POWER MODULE ASSEMBLY WITH MONOPOLAR CELLS

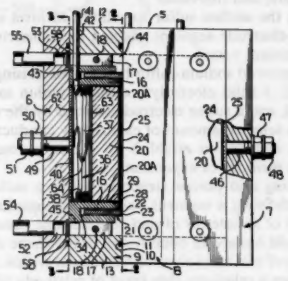
Ronald I. Klootwyk, San Jose, Calif., assignor to The Continental Group, Inc., New York, N.Y.

Filed Oct. 30, 1978, Ser. No. 955,564

Int. Cl.[2] H01M *2/38*

U.S. Cl. 429—68 15 Claims

1. A power module assembly comprising a pair of spaced end plates and a plurality of identical power cells mounted between end plates, each of said power cells comprising a tubular cell frame, means for sealing each cell frame to an adjacent cell frame, each cell frame including first and second sides, an anode guide means positioned within each cell frame in spaced relation to each first side and defining with each adjacent cell frame first side an electrolyte flow passage, an expendable anode mounted between said anode guide means for sliding movement through said cell frame, a screen supported on said anode guide means and engaged by a face of said anode, a cathode plate supported on said anode guide means in face-to-face engagement with said screen, electrolyte flow control means carried by said anode guide means for controlling the flow of electrolyte from one of said electrolyte flow passages to said screen and from said screen to the other of said electrolyte flow passages, a force exerting means within each cell frame and reacting on an associated anode for exerting a constant force on said associated anode to hold each anode in constant pressure contact with a respective one of said screens, and manifold means coupled to said electrolyte flow passages for supplying to and receiving electrolyte therefrom.



4,188,463

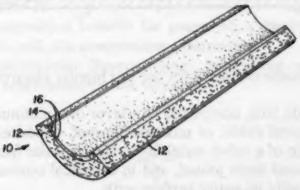
SODIUM-SULFUR BATTERY AND METHOD OF MAKING A DOUBLE CARBON MAT-COMPOSITE SULFUR ELECTRODE FOR USE IN SODIUM-SULFUR CELLS

Joseph D. Arcuri, Jr., Rexford, N.Y., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Feb. 1, 1979, Ser. No. 8,379

Int. Cl.[2] H01M *4/36*

U.S. Cl. 429—104 10 Claims



1. A method for making a composite sulfur electrode for a

sodium-sulfur battery having a containment vessel and a solid electroyte element within said vessel comprising the steps of:

fluffing a selected amount of electrically conductive fibrous matrix material to establish an elastic porous structure having memory of expansion;

packing said porous structure under compression within a mold having a shape conforming to at least a portion of an interior of said containment vessel wherein said mold has a wall conforming to the shape of a surface portion of said solid electrolyte element within said vessel;

introducing molten sulfur into the porous structure in an amount sufficient to substantially permeate said porous structure; and thereafter

allowing the molten sulfur to solidify to form a composite sulfur electrode segment adapted to be inserted into said containment vessel.

4. An improved sodium-sulfur battery comprising a containment vessel, a solid electrolyte element within said containment vessel, and a sulfur electrode formed by the method of:

fluffing a selected amount of electrically conductive fibrous matrix material to establish an elastic porous structure having memory of expansion;

compressing said porous structure within a mold having a shape defining a segment, said segment conforming to a portion of an interior of said containment vessel, wherein said mold has a wall conforming to the shape of a surface portion of said solid electrolyte element within said vessel;

introducing a relatively thin layer of relatively high electrically resistive fibrous material between said porous structure and said electrolyte-shape-conforming wall;

introducing molten sulfur into said mold in an amount sufficient to substantially completely permeate said layer and said porous structure;

allowing said sulfur to cool to a solid to form a composite sulfur electrode segment adapted to be inserted into said containment vessel;

inserting a plurality of said segments into said containment vessel with said fibrous material impinging upon said solid electrolyte element; and

melting said sulfur in said plugs in order to allow said porous structure to expand within said contaiment vessel to form a sulfur electrode in said containment vessel having substantially uniform structure distribution and electrical contact with said electrolyte element.

4,188,464

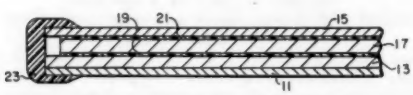
BIPOLAR ELECTRODE WITH INTERMEDIATE GRAPHITE LAYER AND POLYMERIC LAYERS

Robert G. Adams, Niagara Falls; Dirk Pouli; Dana H. Ridgley, both of Williamsville, and Donald E. Stephens, Grand Island, all of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed Jul. 31, 1978, Ser. No. 929,589

Int. Cl.[2] H01M *6/48*

U.S. Cl. 429—210 **11 Claims**



1. A composite electrode for use in a bipolar electrolytic cell comprising

(a) an anode face, comprised of a layer of a platinum group metal, metal oxide, or mixtures thereof, deposited on

(b) one face of a valve metal layer, the opposite face of said valve metal layer joined, and in electrical contact, along substantially its entire surface with

(c) one face of graphite layer, the opposite face of said graphite layer joined, and in electrical contact, along substantially its entire surface with

(d) one face of a cathode material layer, the opposite face of said cathode material layer, providing a cathode face, said valve metal layer, graphite layer, and cathode material layer being joined by a polymeric material on each face of said graphite layer.

4,188,465

STABILIZED UREASE COMPOSITION

Walter Schneider, Weilheim; Albert Roder, Seeshaupt; Hans Mollering, Tutzing, and Ingeborg Gutmann, Percha, uber Starnberg, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Mar. 25, 1977, Ser. No. 781,222

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1976, 2612726

Int. Cl.[2] G01N *31/14*

U.S. Cl. 435—12 **14 Claims**

1. Stabilized urease composition comprising urease of a specific activity of from 25–1500 U/mg and, as a stabilizing agent, a stabilizing mixture of glutathione, ethylenediaminetetraacetic acid and citrate, wherein said citrate is present in stabilizingly effective amount.

4,188,466

AUTOMATIC METHOD FOR THE DETERMINATION OF STARCH

Pierre Thivend, Romagnat; Christiane Mercier-Greenwood, Antony, and André Guilbot, Nantes, all of France, assignors to I.N.R.A., Paris, France

Filed Jul. 6, 1977, Ser. No. 813,275

Claims priority, application France, Jul. 7, 1976, 76 21361

Int. Cl.[2] C12D *13/02;* **G01N** *31/14*

U.S. Cl. 435—18 **12 Claims**

1. The method of analyzing a series of substrates containing starch to determine the weight of the starch in each substrate therein, said method comprising the steps of:

A. suspending a sample of each substrate in particulate form in an aqueous medium to disperse said starch to produce a series of samples to be tested;

B. hydrolyzing the starch dispersion of each sample with an enzymatic hydrolysis preparation containing glucoamylase to convert the dispersed starch into glucose dissolved in the aqueous medium to obtain a hydrolysate, the hydrolyzing step carried out continuously by (1) forming a segmented flow, each segment of which is a mixture of a respective sample of the starch dispersion in the series thereof and the hydrolysis preparation, the segmented flow being constituted by the series of mixture segments isolated by gas-filled gaps which segregate the segments from each other, and (2) causing the segmented flow thus formed to circulate in a hydrolysis enclosure for a period sufficient to convert the dispersed starch in the aqueous medium in each of said mixture segments into glucose dissolved in said aqueous medium to produce a hydrolysate;

C. preparing a glucose solution from the hydrolysate obtained in each of said segments which contains at least a predetermined part of the glucose resulting from the hydrolysis; and

D. determining the weight of the glucose in said glucose solution to deduce therefrom the weight content of the starch in each substrate of said series thereof.

4,188,467

PROCESS FOR TEMPERING TISSUE FOR HEPARIN PRODUCTION

William E. Melby; Charles E. Isdale, Sr., and Vernon K. Collins, all of Champaign, Ill., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Continuation-in-part of Ser. No. 743,373, Nov. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 627,807, Oct. 31, 1975, abandoned. This application Apr. 5, 1978, Ser. No. 893,652

Int. Cl.[2] C12B *1/00*; C08B *37/10*

U.S. Cl. 435—274 8 Claims

1. A process for tempering frozen heparin-bearing animal lung tissue without addition of water, preservatives or enzymes in preparation for isolation of heparin and to maximize heparin availability which comprises the steps of

(1) particulating said lung tissue,

(2) thawing and warming the particulated tissue from step 1, without added water or preservatives, in a heat exchanger and warming said lung tissue to 60°–85° F. within 2 to 30 minutes time using heat exchanger surfaces which do not exceed 140° F. and

(3) fermenting the warmed lung tissue from step 2 without added water or preservatives by spontaneous action of enzymes and bacteria endogenous to the tissue, no additional enzymes or bacteria being added, by holding it at a temperature within the range of about 60° to 85° F. for a period of 5 to 12 hours to substantially effect enzymatic conditioning of said tissue to maximize heparin availability.

4,188,468

PHENYL-SUBSTITUTED 5,6-DIHYDRO-PROSTACYCLIN ANALOGS

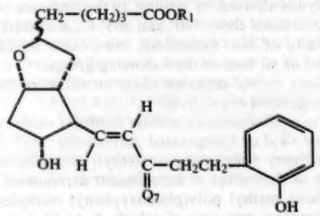
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 857,203, Dec. 5, 1977, Pat. No. 4,125,713, which is a continuation-in-part of Ser. No. 788,147, Apr. 19, 1977, abandoned, which is a continuation-in-part of Ser. No. 691,399, Jun. 1, 1976, abandoned. This application Nov. 13, 1978, Ser. No. 960,373

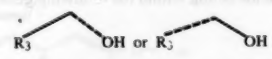
Int. Cl.[2] C07D *307/93*

U.S. Cl. 542—429 15 Claims

1. A compound of the formula



wherein Q_7 is



wherein R_3 is hydrogen or alkyl of one to 4 carbon atoms, inclusive, wherein R_{19} is

(a) alkyl of one to 12 carbon atoms, inclusive,

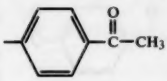
(b) cycloalkyl of 3 to 10 carbon atoms, inclusive,

(c) aralkyl of 7 to 12 carbon atoms, inclusive,

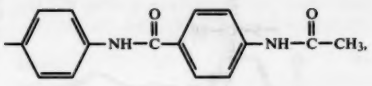
(d) phenyl,

(e) phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive,

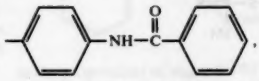
(f)



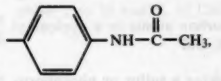
(g)



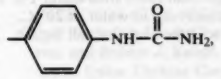
(h)



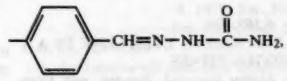
(i)



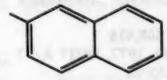
(j)



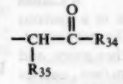
(k)



(l)



(m)



wherein R_{34} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, and wherein R_{35} is hydrogen or benzoyl,

(n) hydrogen; or

(o) a pharmacologically acceptable cation and wherein ~ indicates attachment in alpha or beta configuration.

4,188,469

COMPOSITION OF HYDROPHILIC FLUOROPOLYMERS WITH FIBROUS MATTER AND LIQUID CARRIER

James C. Fang, Media, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 699,302, Jun. 24, 1976, abandoned, which is a continuation-in-part of Ser. No. 579,099, May 20, 1975, abandoned. This application Apr. 11, 1978, Ser. No. 895,468

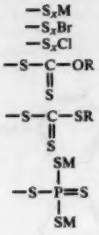
Int. Cl.[2] C08F *8/42, 8/40, 8/34*; C25B *13/08*

U.S. Cl. 526—18 2 Claims

1. A composition suitable for preparing a diaphragm for a chlor-alkali cell, the composition comprising

(a) a hydrophilic fluoropolymer containing nonterminal units represented by the structure

where Z is



where

M is hydrogen, sodium, potassium, lithium, calcium or magnesium;

R is an alkyl radical of 1–12 carbon atoms or a cycloalkyl radical of 3–12 carbon atoms; and

x is 1, 2, 3, 4 or 5,

the hydrophilic fluoropolymer having a sulfur or phosphorus content of about 0.1–10% by weight, not more than about 1% by weight of the fluoropolymer dissolving in water at 20° C.;

(b) a fibrous material resistant to attack by the cell liquor; and

(c) a liquid carrier.

4,188,470

PROCESS FOR POLYMERIZING ETHYLENE IN A GASEOUS PHASE

Amilcare Collina, Milan; Arrigo Soverini, Novara, and Francesco Rosati, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Jan. 11, 1978, Ser. No. 868,618

Claims priority, application Italy, Jan. 12, 1977, 19217 A/77

Int. Cl.[2] C08F *2/34, 4/02, 10/02*

U.S. Cl. 526—64 **6 Claims**

1. Process for the polymerization of ethylene in a gaseous phase, in a tubular reactor in which the flow of the gas consisting of ethylene or a mixture of ethylene with other gases, and having a flow rate comprised between 2 and 5 m/sec., carries the catalyst and the polymer particles that are formed at a mean velocity about equal for all the particles, the polymerization being conducted in the presence of a catalyst obtained by mixing at least one compound of a transition metal selected from the group consisting of titanium, vanadium, zirconium and chromium, with an organometallic compound or hydride of a metal belonging to Groups I to III of the Mendelyeev Periodic System, and having a starting polymerization speed such that a yield of at least 100,000 g of polymer/g of transition metal is obtained within the first 15 minutes of the polymerization reaction.

4,188,471

ORGANOCHROMIUM ON TITANIUM-IMPREGNATED BASE AS OLEFIN POLYMERIZATION CATALYST

Benny E. Nasser, Jr., and Joseph A. Delap, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 4, 1974, Ser. No. 529,551

Int. Cl.[2] C08F *4/02, 10/02*

U.S. Cl. 526—96 **8 Claims**

1. A process for producing a catalyst comprising:

impregnating a particulate support of a silica coprecipitated with a titanium compound with a nonaqueous solution of tetraisopropyl titanate in an amount sufficient to give 0.5 to 3 weight percent titanium based on the weight of said support;

calcining said titanium-impregnated support in air at a temperature within the range of 900° to 1700° F.;

thereafter impregnating the thus calcined titanium-treated support with a nonaqueous solution of a π-bonded organochromium compound selected from dibenzene chromium or dicumene chromium in an amount sufficient to give 0.1 to 10 percent by weight of the organochromium compound per 100 parts by weight of said calcined support; and

thereafter heating the thus-organochromium-impregnated support in a nitrogen atmosphere at a temperature within the range of 300° to 400° F. for 0.5 to 20 hours to activate same.

4,188,472

CURABLE LACTONE DERIVED RESINS

Wen-Hsuan Chang, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

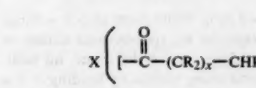
Filed Oct. 6, 1978, Ser. No. 949,181

Int. Cl.[2] C08G *18/42*

U.S. Cl. 528—75 **23 Claims**

1. A curable lactone derived resin which is the reaction product of:

(a) from about 30 percent to about 95 percent by weight of a lactone modified resin of formula



wherein X is the organic radical formed by removing at least one hydroxyl hydrogen atom from an ester containing from 1 to 3 acrylyl or alpha-substituted acrylyl groups and one or two hydroxyl groups, R is hydrogen or an alkyl group having from 1 to 12 carbon atoms, x is from 4 to 7 and at least (x+2) R's are hydrogen, n has an average value of from about 0.2 to about 5, and a is 1 or 2; and

(b) from about 5 percent to about 70 percent by weight of an isocyanate.

4,188,473

HIGH TEMPERATURE POLYMERS

Donald L. Nelson, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 394,011, Sep. 4, 1973, abandoned. This application Jan. 13, 1978, Ser. No. 869,337

Int. Cl.[2] C08G *65/00*

U.S. Cl. 528—86 **12 Claims**

1. A polymer derived by heating, in the presence of an acid catalyst at between about 140° and 165° C., a mixture consisting essentially of one monomeric compound selected from each of two or all four of the following groups

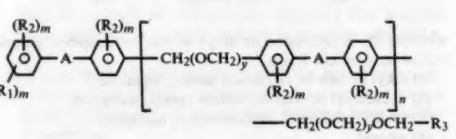
A. methoxy methyl diphenyl oxide or sulfide or their alkyl or halogenated derivatives;

B. methoxy poly(methoxy)methyl diphenyl oxide or sulfide or their alkyl or halogenated derivatives;

C. di[methoxy poly(methoxy)methyl] diphenyl oxide or sulfide or their alkyl or halogenated derivatives;

D. methoxy methyl poly(phenoxyphenyl methylene) phenoxybenzene, any one of which A to D may contain unreacted diphenyl oxide or sulfide and bis(phenoxy phenyl) methane,

said compounds falling within the following generic formula



wherein each A represents a chalcogen independently selected from the group oxygen and sulfur; R_1 represents a

member selected from the group hydrogen, $-CH_2(OCH-2)_yOCH_2-R_3$; each R_2 represents a member independently selected from the group consisting of R_1, halogen and an alkyl group of 1 to 10 carbon atoms; R_3 represents a member selected from the group consisting of H, methyl, ethyl and propyl; each m represents an independently selected integer from 1 to 2; n represents an integer from 0 to 60 and y represents an integer from 0 to 3.

4,188,474

EPOXY CURING ACCELERATOR

Harold G. Waddill, and Philip H. Moss, both of Austin, Tex., assignors to Texaco Development Corporation, White Plains, N.Y.

Filed Sep. 11, 1978, Ser. No. 941,819
Int. Cl.[2] C08G *59/56, 59/58*
U.S. Cl. 528—111 **8 Claims**

1. A method for accelerating the cure of an anhydride cured epoxy resin composition which comprises

(a) adding to the epoxy resin-anhydride composition an amount of oligomeric poly(ethylenepiperazine) effective for accelerating the cure of the composition and

(b) heating the resulting mixtures from (a) to effect a cure.

4,188,475

PROCESS FOR THE PREPARATION OF FLAME-RETARDANT POLYCARBONATES

Dieter Margotte, Krefeld, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 30, 1978, Ser. No. 920,932
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1977, 2732556
Int. Cl.[2] C08G *63/62*
U.S. Cl. 528—175 **8 Claims**

1. In a process for the preparation of an aromatic polycarbonate from diphenols by a two-phase interface process, the improvement wherein an aromatic monosulphonic acid chloride is used as a chain stopper in an amount of from about 2 mol % to 20 mol %, relative to the number of mols of diphenol.

4,188,476

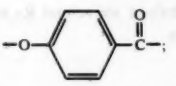
AROMATIC POLYESTER CONSISTING ESSENTIALLY OF P-OXYBENZOYL UNITS, TEREPHTHALOYL UNITS, 2,6-DIOXYNAPHTHALENE OR 2,6-DIOXYANTHRAQUINONE UNITS AND M-OXYBENZOYL OR 1,3-DIOXYPHENYLENE UNITS

Robert S. Irwin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

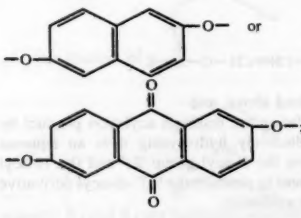
Filed Apr. 6, 1979, Ser. No. 27,939
Int. Cl.[2] C08G *63/18, 63/60*
U.S. Cl. 528—190 **8 Claims**

1. Fiber-forming copolyesters consisting essentially of units I, II, III and IV having the structural formulas:

I



II



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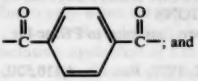
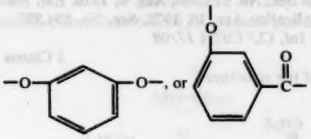
III



IV



in the proportions of about 50–70 mol % of Unit I, about 10–23 mol % of Unit II, about 15–25 mol % of Unit III and from about 2 to 10 mol % of Unit IV.

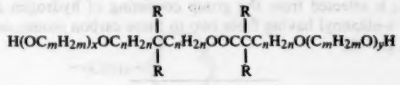
4,188,477

ISOCYANATE DERIVATIVES OF ESTER DIOL ALKOXYLATES AND COMPOSITIONS THEREOF

Oliver W. Smith, South Charleston; Joseph V. Koleske, Charleston, and Robert J. Knopf, Saint Albans, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 837,720, Sep. 29, 1977. This application Jan. 4, 1979, Ser. No. 882
Int. Cl.[2] C08G *63/68*
U.S. Cl. 528—288 **20 Claims**

1. An isocyanate modified ester diol alkoxylate comprising the reaction product of (A) an ester diol alkoxylate of the general formula:



wherein m is an integer having a value of from 2 to 4, n is an integer having a value of from 1 to 5, x and y are integers each having a value of from 1 to 20 and R is an alkyl group having from 1 to 8 carbon atoms; and (B) from 0.025 to 0.9 isocyanato equivalent per hydroxyl equivalent of a polyisocyanate.

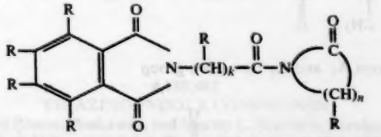
4,188,478

INITIATORS FOR LACTAM POLYMERIZATION HAVING FIRST FUNCTIONAL GROUP,INTERMEDIATE GROUP, SECOND FUNCTIONAL GROUP

Charles V. Goebel, Jr., Wyomissing, Pa., assignor to The Polymer Corporation, Reading, Pa.

Filed Nov. 20, 1978, Ser. No. 961,868
Int. Cl.[2] C08G *69/18*
U.S. Cl. 528—314 **4 Claims**

1. A method for the base catalized polymerization of lactams to form solid products comprising reacting a lactam in the presence of catalyst with an initiator of the general formula:



where k and n are each from 1 to 14 and each R is independently selected from the group consisting of hydrogen, alkyl having 1 to 13 atoms, aryl, substituted aryl, halogen, nitro, nitroso, amino, alkyl substituted amino, carboxyl, and carboalkoxy.

4,188,479

SEMI-SYNTHETIC OLEANDOMYCIN DERIVATIVES-C8 MODIFICATIONS

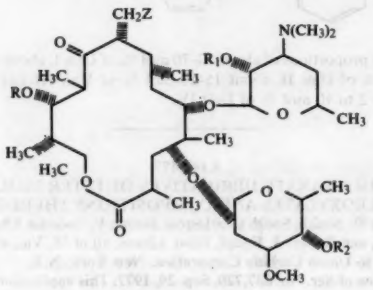
Frank C. Sciavolino, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 766,219, Feb. 7, 1977, Pat. No. 4,110,530, which is a division of Ser. No. 712,360, Aug. 6, 1976, Pat. No. 4,036,853. This application Apr. 10, 1978, Ser. No. 894,897

Int. Cl.[2] C07H *17/08*

U.S. Cl. 536—9 **2 Claims**

1. A compound of the structure:



and the pharmaceutically acceptable acid addition salts thereof wherein:

R is selected from the group consisting of hydrogen and n-alkanoyl having from two to three carbon atoms;

R_1 is selected from the group consisting of hydrogen and n-alkanoyl having from two to three carbon atoms;

R_2 is selected from the group consisting of hydrogen and n-alkanoyl having from two to three carbon atoms; and

Z is —Cl.

4,188,480

PROCESS FOR THE PRODUCTION OF A 9,3″-DI-ACYL DERIVATIVE OF A MACROLIDE ANTIBIOTIC

Takeshi Nakamura; Satoru Nakabayashi, both of Yokohama; Shunzo Fukatsu, and Shigeo Seki, both of Tokyo, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

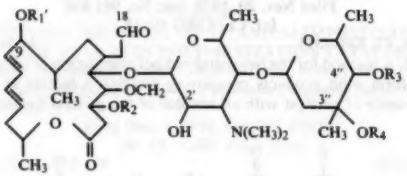
Filed Aug. 10, 1978, Ser. No. 933,188

Claims priority, application Japan, Aug. 15, 1977, 52-97071

Int. Cl.[2] C07H *1/00*

U.S. Cl. 536—17 R **10 Claims**

1. A process for the production of a 9,3″-di-acyl derivative of a macrolide antibiotic of the formula:

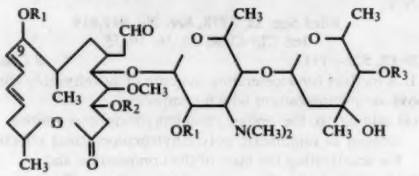


wherein R_1' and R_4 are each a group

in which R is alkyl of 1–6 carbon atoms, aralkyl of 6–10 carbon atoms or phenyl-alkenyl of 8–11 carbon atoms; R_2 is acetyl or propionyl; and R_3 is a group

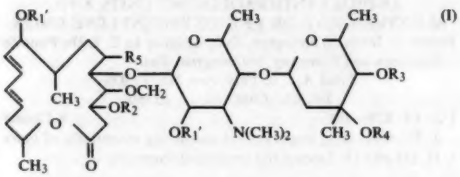
in which R′ is methyl, ethyl, propyl, isopropyl or isobutyl, which comprises:

(a) acylating a macrolide antibiotic or a monoacyl derivative thereof of the formula:



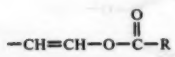
where R_1 is hydrogen or a group

in which R is as defined above, and R_2 and R_3 are each as defined above, by reacting the macrolide antibiotic or its monoacyl derivative with an organic acid halide of the formula RCOX wherein R is alkyl of 1–6 carbon atoms; aralkyl of 6–10 carbon atoms or phenyl-alkenyl of 8–11 carbon atoms and X is halogen, in an inert organic solvent under anhydrous conditions and in the presence of a molecular sieve consisting essentially of a synthetic zeolite having a pore diameter of 3–5 Angstroms at a temperature of 50°–90° C. to produce at least one acylation product of the formula:



(I)

wherein R_1', R_2, R_3 and R_4 are as defined above and R_5 is —CH_2CHO or



in which R is as defined above, and

(b) partially deacylating the resultant acylation product by partially and selectively hydrolyzing it in an aqueous alkanol to remove the 2′-acyl group R_1' and the 18-acyl group when present to produce the 9,3″-di-acyl derivative of the macrolide antibiotic.

4,188,481

PYRAN ANALOGS OF 2,3,4,5-TETRADEHYDRO-PGI$_1$ COMPOUNDS

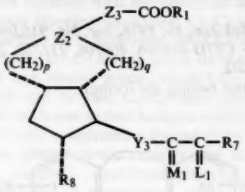
John C. Sih, Kalamazoo Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 821,541, Aug. 3, 1977, Pat. No. 4,109,082. This application May 8, 1978, Ser. No. 904,190

Int. Cl.^{2} C07D *311/94*

U.S. Cl. 542—426 **79 Claims**

1. A prostacyclin analog of the formula



wherein one of p and q is one and the other is zero; wherein Z_3 is trans—CH=CH—; wherein Y_3 is

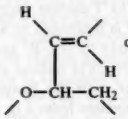
(1) trans—CH=CH—,

(2) cis—CH=CH—,

(3) —CH_2CH_2—, or

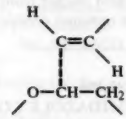
(4) —C≡C—,

wherein Z_2 is



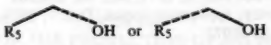
(1)

or



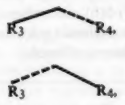
(2)

wherein R_8 is hydrogen, hydroxy, or hydroxymethyl; wherein M_1 is

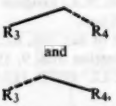


wherein R_5 is hydrogen or alkyl with one to 4 carbon atoms, inclusive,

wherein L_1 is

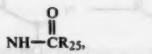


or a mixture of

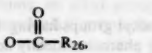


wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

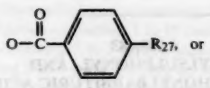
wherein R_1 is hydrogen; alkyl of one to 12 carbon atoms, inclusive; cycloalkyl of 3 to 10 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive; phenyl; phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms; phenyl substituted in the para position by



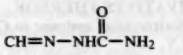
(a)



(b)



(c)

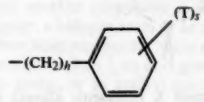


(d)

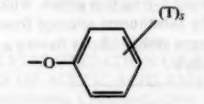
wherein R_{25} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or —NH_2; R_{26} is methyl, phenyl, —NH_2, or methoxy; and R_{27} is hydrogen or acetamido; phenacyl; phenacyl substituted in the para position by chloro, bromo, phenyl, or benzamido; or a pharmacologically acceptable cation;

wherein R_7 is

(1) —$(CH_2)_m$—CH_3,



(2)



(3)

wherein m is the integer one to 5, inclusive, h is the integer zero to 3, inclusive; s is the integer zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, with the proviso that not more than two T's are other than alkyl .

4,188,482

THIAZINO INDOLE COMPOUNDS

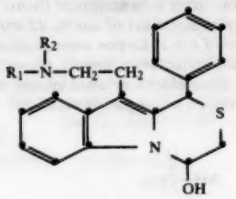
Harold Zinnes, Rockaway, and Martin L. Schwartz, Parsippany, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 4, 1978, Ser. No. 902,584

Int. Cl.^{2} A61K *31/54*; C07D *513/04*

U.S. Cl. 544—32 **8 Claims**

1. A compound of the formula



I

where R_1 and R_2 are alkyl groups having 1 to 6 carbon atoms and the corresponding pharmaceutically acceptable acid addition salts.

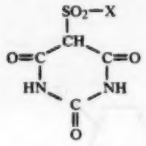
4,188,483

5-ALKYLSULPHONYL- AND 5-ALKENYLSULPHONYLBARBITURIC ACIDS AND DERIVATIVES THEREOF

Karl Hoegerle, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 8, 1978, Ser. No. 903,633
Claims priority, application Luxembourg, May 9, 1977, 77288
Int. Cl.[2] C07D *239/62*
U.S. Cl. 544—302 **8 Claims**

1. A compound of the formula I



(I)

or a salt thereof, wherein X represents alkenyl having 2–4 carbon atoms, alkyl having 1–6 carbon atoms, which is unsubstituted or substituted by substituents selected from the group consisting of 1 to 3 halogen atoms, alkoxy having a 1–6 carbon atoms, phenyl or naphthyl.

4,188,484

(2-PYRIMIDINYL-THIO)-ALKANOIC ACID AMIDES AND THEIR PREPARATION

Carlo Scolastico, and Giovanni Tronconi, both of Milan, Italy, assignors to L'Instituto Farmaceutico S.p.A., Balsamo, Italy

Continuation of Ser. No. 771,579, Feb. 24, 1977, abandoned. This application Sep. 29, 1978, Ser. No. 947,094
Claims priority, application Italy, Mar. 17, 1976, 21317 A/76
Int. Cl.[2] A61K *31/505;* **C07D** *239/42, 413/12;* **A61K** *31/535*
U.S. Cl. 544—317 **11 Claims**

1. A compound selected from the group consisting of
[4-chloro-6-(2,3-xylidino-2-pyrimidinyl-thio]-(N-β-hydroxyethyl)-acetamide,
[4-chloro-6-(2,3-xylidino)-2-pyrimidinyl-thio]-(N,N-bis-β-hydroxyethyl)-acetamide,
[4-chloro-6-(2,3-xylidino)-2-pyrimidinyl-thio]-N-α-methyl-β-hydroxyethyl)-acetamide,
[4-chloro-6-(p-chloroanilino)-2-pyrimidinyl-thio]-(N-β-hydroxyethyl)-acetamide,
[4-chloro-6-benzylamino-2-pyrimidinyl-thio]-(N-β-hydroxyethyl)-acetamide,
[4-chloro-6-anilino-2-pyrimidinyl-thio](N-β-hydroxyethyl)-acetamide,
[4-chloro-6-p-methoxyanilino)-2-pyrimidinyl-thio]-(N-β-hydroxyethyl-acetamide,
[4-chloro-6-(2,3-xylidino)-2-pyrimidinyl-thio]-(N-β-mercaptoethyl)-acetamide,
[4-chloro-6-(2,3-xylidino)-2-pyrimidinyl-thio]-(N-3-hydroxypropyl)-acetamide, and
[4-chloro-6-(2,3-xylidino)-2-pyrimidinyl-thio]-(N-4-hydroxybutyl)-acetamide.

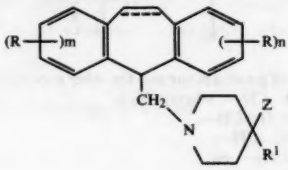
4,188,485

1-[(10,11-DIHYDRO-5H-DIBENZO[A,D]-CYCLOHEPTEN-5-YL)METHYL]-4-SUBSTITUTED PIPERIDINES AND RELATED COMPOUNDS

Michael J. Kukla, Skokie, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Filed Jun. 16, 1978, Ser. No. 916,040
Int. Cl.[2] C07D *405/06, 409/06, 211/58, 211/48*
U.S. Cl. 546—202 **14 Claims**

1. A compound having the formula



or a non-toxic pharmaceutically acceptable acid addition salt thereof; wherein R in each occurrence represents hydrogen, halogen, alkyl radical of 1 to 7 carbon atoms, or trifluoromethyl, alike or different; R^1 is hydrogen or alkyl radical of 1 to 7 carbon atoms; Z is hydroxy or NR^2R^3 group wherein R^2 and R^3 are each hydrogen or alkyl radical of 1 to 7 carbon atoms or R^2 and R^3 together with the N-atom represent an azamonocyclic ring which contains from 4 to 6 carbon atoms; m and n are each alike or different integer from 1 to 4 inclusive; and the dotted line represents optional double bond.

4,188,486

2-SUBSTITUTED BENZIMIDAZOLE COMPOUNDS

Goro Tsukamoto, Toyonaka; Koichiro Yoshino, Settsu; Toshihiko Kohno, Sakai; Masahiro Taguchi, Settsu; Katsumi Dezawa, Settsu; Hajime Kagaya, Settsu; Keiso Ito, Osaka, and Takashi Nose, Suita, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Filed Dec. 2, 1977, Ser. No. 856,969
Claims priority, application Japan, Dec. 7, 1976, 51-148495; Apr. 7, 1977, 52-40072
Int. Cl.[2] C07D *401/02*
U.S. Cl. 546—271 **6 Claims**

1. An anti-inflammatory compound selected from the group consisting of
2-(6-methylpyridin-2yl)-5(6)-methylbenzimidazole;
2-(6-methylpyridin-2yl)-5(6)-methylbenzimidazole;
2-(6-methylpyridin-2-yl)-5(6)-chlorobenzimidazole;
2-(5-ethylpyridin-2-yl)-benzimidazole; and
2-(6-ethylpyridin-2-yl)-benzimidazole.

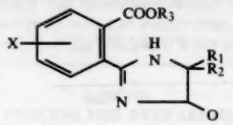
4,188,487

IMIDAZOLINYL BENZOIC ACIDS, ESTERS AND SALTS AND THEIR USE AS HERBICIDAL AGENTS

Marinus Los, Pennington, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 822,458, Aug. 8, 1977, abandoned. This application Jun. 9, 1978, Ser. No. 914,244
Int. Cl.[2] C07D *233/04*
U.S. Cl. 548—301 **20 Claims**

1. A compound having the structure:



wherein X is hydrogen, alkyl C_1–C_3, halogen or nitro; R_1 is alkyl C_1–C_4; R_2 is alkyl C_1–C_6, cycloalkyl C_3–C_6, or when R_1 and R_2 are taken together with the carbon to which they are attached they may represent cycloalkyl C_3–C_6 optionally substituted with methyl; R_3 is hydrogen, alkyl C_1–C_{12} optionally substituted with one C_1–C_3 alkoxy group or one C_3–C_6 cycloalkyl group or one phenyl group, alkenyl C_3–C_5 optionally substituted with one or two C_1–C_3 alkyl group(s) or one phenyl group or with one to two halogen substituents(s), alkynyl C_3–C_5 optionally substituted with one or two C_1–C_3 alkyl group(s) or one phenyl group or with one to two halogen substituent(s), benzyl, cyclohexenylmethyl, ethynylcyclohexyl, ethynylallyl or pentadienyl, cycloalkyl C_3–C_6 optionally substituted with one or two C_1–C_3 alkyl group(s); or a salt-forming cation of alkali metals, ammonium and lower aliphatic ammonium, and when R_1 and R_2 are not the same the optical isomers thereof, and the isomeric mixtures thereof; and except when R_3 is a slat-forming cation, the acid addition salts thereof.

4,188,488

ODORANT AND/OR FLAVORING DISULPHIDES, COMPOSITIONS CONTAINING SAME AND PROCESS FOR MAKING SAME

Paul Dubs, Zürg, and Heiner Kuntzel, Dübendorf, both of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 726,100, Sep. 24, 1976, Pat. No. 4,130,562.
This application May 15, 1978, Ser. No. 906,294
Claims priority, application Switzerland, Oct. 1, 1975, 12728/75; Jul. 20, 1976, 9280/76
Int. Cl.[2] C07D *233/64*
U.S. Cl. 548—337 **5 Claims**

1. A disulfide having the formula:

$$R_1—(Y)_n—S—S—R_2$$

wherein R_1 is C_{1-6}-alkyl substituted 2-imidazolyl group, Y is an optionally mono- or di-C_{1-6}alkyl substituted methylene group, n is an integer from 0 to 5, and R_2 is a C_{1-6}-alkyl group.

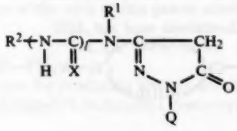
4,188,489

PROCESS FOR THE PRODUCTION OF 3-SUBSTITUTED AMINO-5-PYRAZOLONES

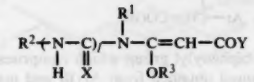
Masatoshi Sugiyama, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Apr. 16, 1976, Ser. No. 677,452
Claims priority, application Japan, Apr. 16, 1975, 50-45996
Int. Cl.[2] C07D *231/52*
U.S. Cl. 548—360 **12 Claims**

1. A process for producing 3-substituted amino-5-pyrazolones containing at least one sulfo group represented by formula (I) which comprises reacting a β-substituted amino-β-alkoxy acrylic acid derivative represented by formula (II) and a hydrazine containing at least one sulfo group represented by formula (III) in a mixture of acetic acid and triethylamine,

 (I)

-continued

 (II)

(III)

wherein

R^1 is a hydrogen atom, a perfluoroalkyl group containing 1 to 12 carbon atoms, an alkyl group containing 1 to 18 carbon atoms, a cycloalkyl group containing 5 to 7 carbon atoms, an aralkyl group containing 7 to 13 carbon atoms or a monocyclic aryl group;

R^2 is a perfluoroalkyl group containg 1 to 12 carbon atoms, an alkyl group containing 1 to 18 carbon atoms, an alkenyl group containing 2 to 5 carbon atoms, a cycloalkyl group containing 5 to 7 carbon atoms, an aralkyl group containing 7 to 13 carbon atoms, a monocyclic or bicyclic aryl group or a carboxylic acyl group containing 2 to 8 carbon atoms, an alkylsulfonyl group containing 1 to 4 carbon atoms or an aryl sulfonyl group; l is 0 or 1 and where l is 0, R^1 and R^2 may combine with each other to form a pyrrolidine, piperidine, morpholine or piperazine ring;

R^3 is an aliphatic group containing 1 to 6 carbon atoms or an aralkyl group containing 7 to 8 carbon atoms;

X is oxygen or sulfur;

Y is a hydroxy group, an alkoxy, an aralkoxy group or a primary, secondary or tertiary amino group; and

Q is an alkyl group containing 1 to 6 carbon atoms and at least one sulfo group, a substituted alkyl group containing 2 to 5 carbon atoms and one substituent thereof is a sulfo group and another substituent is a hydroxy group, an alkoxy group, a halogen atom or an alkenyl group, whose total carbon atom number exclusive of those in the substituents is not more than 5, an aryl group containing at least one sulfo group, or an aralkyl group containing at least one sulfo group.

4,188,490

CATALYTIC OXIDATION OF ETHYLENE TO MIXTURES OF ACETIC ACID AND VINYL ACETATE

James A. Hinnenkamp, Cincinnati, Ohio, and John A. Scheben, Erlanger, Ky., assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed May 27, 1977, Ser. No. 801,282
Int. Cl.[2] C07C *53/08, 67/00*
U.S. Cl. 560—245 **9 Claims**

1. A process for catalytically oxidizing ethylene to mixtures of acetic acid and vinyl acetate which comprises reacting ethylene and oxygen in the presence of steam within the temperature range of from about 150° C. to about 250° C. in the vapor phase in contact with a catalytically effective amount of a catalyst system comprising palladium metal on a zinc oxide support in the presence of a sulfur-containing catalyst modifier having from two to four atoms of oxygen associated with each sulfur atom.

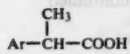
4,188,491

PREPARATION OF THERAPEUTIC COMPOUNDS

John S. Nicholson, Beeston, and John L. Turner, East Leake, both of England, assignors to The Boots Company Limited, England

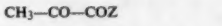
Continuation of Ser. No. 672,300, Mar. 31, 1976, abandoned.
This application Mar. 24, 1978, Ser. No. 889,644
Claims priority, application United Kingdom, Apr. 4, 1975, 13817/75
Int. Cl.[2] C07C *63/33*
U.S. Cl. 562—492 **6 Claims**

1. A process for preparing a compound of formula I



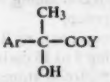
I

wherein Ar is a 4-biphenylyl group which comprises reacting a Grignard compound obtained from Ar_1Br and magnesium, wherein Ar_1 is Ar, with a compound of formula II



II

wherein Z is ONa, and acidifying the mixture to give a compound of formula III



III

where Y is OH and converting this to the compound of formula I.

4,188,492

PROCESS FOR CONVERTING 2,2-DICHLOROVINYLCYCLOPROPANES TO DIBROMOVINYL ANALOGS

Kiyoshi Kondo, and Kiyohide Matsui, both of Kanagawa, Japan, assignors to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 875,650, Feb. 6, 1978, abandoned. This application Jan. 3, 1979, Ser. No. 737

Int. Cl.[2] C07C *51/00, 67/30*

U.S. Cl. 562—506 **6 Claims**

1. A process for preparing 3-(2,2-dibromovinyl)-2,2-dimethylcyclopropanecarboxylic acid or a lower alkyl ester thereof which comprises exchanging the chlorine atoms in 3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylic acid or a lower alkyl ester thereof with bromine atoms wherein said exchange is effected in a solvent with HBr and the product of the reaction of HBr with aluminum or an aluminum salt.

4,188,493

PROCESS FOR RECOVERING CMOS

Thomas J. Walter, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Mar. 28, 1977, Ser. No. 781,574

Int. Cl.[2] C07C *59/23, 51/42*

U.S. Cl. 562—580 **16 Claims**

1. In a process for recovering water soluble salts of carboxyalkyloxy succinic acids from an aqueous system thereof containing a precipitate of alkaline earth metal or zinc carbonate, the improvement of adjusting the pH of the aqueous system to about 6 to 9, treating the pH-adjusted system with an alkali metal carbonate, maintaining the treated system at a temperature of from about 70° to about 125° C. and separating precipitated alkaline earth metal carbonate from the system while maintaining the temperature within said temperature range.

4,188,494

HYDROGEN FLUORIDE REMOVAL FROM GLYCOLIC ACID

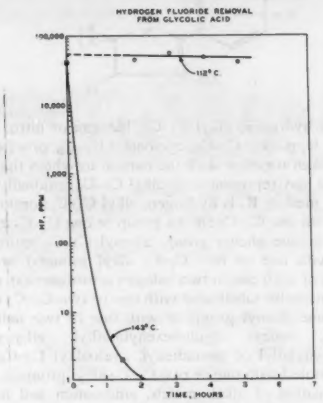
Shigeto Suzuki, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 790,221, Apr. 25, 1977, abandoned. This application Aug. 7, 1978, Ser. No. 931,333

Int. Cl.[2] C07C *59/06*

U.S. Cl. 562—580 **4 Claims**

1. In a process for the removal of hydrogen fluoride by inert gas stripping or distillation from a crude glycolic acid obtained by the hydrogen fluoride catalyzed reaction of formaldehyde and carbon monoxide, the improvement which comprises effecting said removal at a temperature in excesss of about 130° C. at atmospheric pressure to produce polyglycolide, thereafter hydrolyzing said polyglycolide and recovering pure glycolic acid.



4,188,495

1,9-DIHYDROXYOCTAHYDROPHENANTHRENES AND INTERMEDIATES THEREFOR

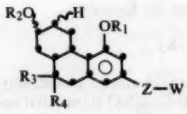
Thomas H. Althuis, Groton; Charles A. Harbert, Waterford; Michael R. Johnson, and Lawrence S. Melvin, Jr., both of Gales Ferry, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Nov. 14, 1977, Ser. No. 851,503

Int. Cl.[2] C07C *43/20;* **A61K** *31/085*

U.S. Cl. 568—633 **13 Claims**

1. A compound selected from the group consisting of those having the formulae



I

wherein

R_1 is hydrogen, benzyl, benzoyl or alkanoyl of 1 to 5 carbon atoms;

R_2 is selected from hydrogen, alkanoyl of 1 to 6 carbon atoms and benzoyl;

R_3 is selected from hydrogen, methyl and ethyl;

R_4 is selected from hydrogen, alkyl of 1 to 6 carbon atoms and benzyl;

Z is selected from:

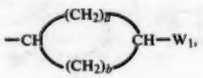
(a) alkylene having from one to nine carbon atoms;

(b) $-(alk_1)_m-X-(alk_2)_n-$ wherein each of (alk_1) and (alk_2) is alkylene having from 1 to 9 carbon atoms, with the proviso that the summation of carbon atoms in (alk_1) plus (alk_2) is not greater than 9;

m and n are each 0 or 1;

X is selected from O, S, SO and SO_2; and

W is selected from hydrogen, methyl, phenyl, monochlorophenyl, monofluorophenyl and



wherein W_1 is selected from hydrogen, phenyl, monochlorophenyl and monofluorophenyl; a is an integer from 1 to 5 and b is 0 or an integer from 1 to 4, with the proviso that the sum of a and b is not greater than 5.

4,188,496

PROCESS FOR PREPARING 2,2-BIS(4-HYDROXY-PHENYL) PROPANE FROM DISTILLATION BY-PRODUCTS THEREOF

Donald B. G. Jaquiss, New Harmony, and Lawrence C. Mitchell, Mt. Vernon, both of Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 23, 1977, Ser. No. 863,667
Int. Cl.² C07C *37/44, 37/24*
U.S. Cl. 568—723 **6 Claims**

1. A process for the production of 2,2-bis(4-hydroxyphenyl)-propane from by-products which contain products isomerizable to 2,2-bis(4-hydroxyphenyl)propane and which remain after purification distillation of 2,2-bis(4-hydroxyphenyl)propane produced by the condensation of phenol and acetone, said process comprising

(i) preparing a starting mixture of by-products and phenol, said by-products containing products isomerizable to 2,2-bis(4-hydroxyphenyl)propane;

(ii) adding anhydrous hydrogen bromide to the starting mixture and isomerizing said by-products to 2,2-bis(4-hydroxyphenyl)propane at ambient pressure; and

(iii) subsequently recovering said 2,2-bis(4-hydroxyphenyl)-propane.

4,188,497

PURIFICATION OF 3,5-XYLENOL

Leendert Huizer; Dirk J. Van Namen, and Pieter J. D. Oranje, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 25, 1978, Ser. No. 872,132
Claims priority, application United Kingdom, Feb. 2, 1977, 4201/77
Int. Cl.² C07C *37/06, 37/22*
U.S. Cl. 568—799 **4 Claims**

1. In the process in which isophorone is heated to a temperature of about 450° C. to about 650° C. in the presence of a homogeneous catalyst comprising a halogen having an atomic number of at least 17 or an organic compound containing said halogen to produce a liquid reaction mixture containing 3,5-xylenol and halogen residues from which reaction mixture the halogen residues are subsequently removed, the improvement which comprises contacting, at a temperature of from about 100° to about 200° C. for a period of approximately 0.5 to 5 hours, the reaction mixture with at least one metal selected from the group consisting of zinc, iron, magnesium, cadmium, cobalt, and nickel, using from about 0.01% to about 5% by weight of the metal, based on the weight of 3,5-xylenol in the reaction mixture, thereby removing halogen residues from the reaction mixture.

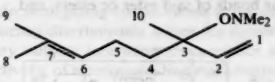
4,188,498

PROCESS FOR PRODUCING LINALOOL

Atsuo Murata; Shuji Tsuchiya; Hideo Suzuki, and Hisao Ikeda, all of Funabashi, Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Filed May 3, 1978, Ser. No. 902,753
Claims priority, application Japan, May 18, 1977, 52-57385
The portion of the term of this patent subsequent to Aug. 15, 1995, has been disclaimed.
Int. Cl.² C07C *33/02*
U.S. Cl. 568—875 **10 Claims**

1. A process for producing linalool which comprises hydrogenating O-linalyl-N,N-dimethyl hydroxylamine having the formula



(I)

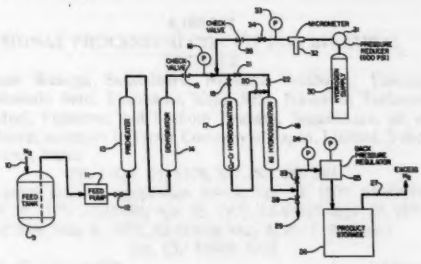
wherein Me represents a methyl group and the reference numerals 1 to 10 represent 1 to 10 carbon positions, under a hydrogen partial pressure of lower than 30 kg/cm² in the presence of a catalyst which is a combination of a first component selected from the group consisting of Ni, Co and mixtures thereof with a modifying component selected from the group consisting of Al, Ge, Sn, As, Sb, S, Se and Cr.

4,188,499

PURIFICATION OF ALCOHOL

Thomas J. Walter, Baton Rouge, and Sebastian M. Laurent, Greenwell Springs, both of La., assignors to Ethyl Corporation, Richmond, Va.

Continuation of Ser. No. 678,148, Apr. 19, 1976, abandoned.
This application Nov. 28, 1977, Ser. No. 855,269
Int. Cl.² C07C *29/24*
U.S. Cl. 568—914 **15 Claims**



1. A process for treating alcohol containing at least an impurity amount of radicals of the type (>CHOH) to provide a product having a lesser amount of (>CHOH) radicals which comprises, contacting said alcohol at a temperature of from about 200° to about 300° C., in the liquid phase with an uncalcined alkali metal hydroxide treated alumina catalyst.

12. A process in accordance with claim 1 wherein the alcohol is subjected to hydrogenation concurrently with the treatment or subsequent thereto to reduce the iodine value of the alcohol.

4,188,500

CONVERSION OF SULFONIC ACIDS INTO A HYDROCARBON OIL OF SUPERIOR OXIDATION STABILITY

David S. Bosniack, and Paul F. Korbach, both of Baytown, Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

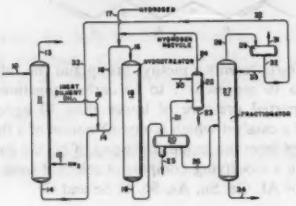
Division of Ser. No. 749,595, Dec. 10, 1976, Pat. No. 4,110,196.
This application Mar. 30, 1978, Ser. No. 891,583
Int. Cl.² C10G *23/00*
U.S. Cl. 585—1 **7 Claims**

1. A process for converting a sulfonic acid or a mixture of sulfonic acids into a hydrocarbon oil of superior oxidation stability comprising:

(a) transforming said sulfonic acid or mixture of sulfonic acids into a sulfonic acid ester or a mixture of sulfonic acid esters;

(b) reacting said ester or mixture of esters with hydrogen in

the presence of a hydrotreating catalyst to cleave the carbon-sulfur bonds of said ester or esters; and



(c) recovering a hydrocarbon oil or superior oxidation stability from the reaction products of step (b).

4,188,501

PURIFICATION OF MONOOLEFIN-CONTAINING HYDROCARBON STREAM

Mark R. Rycheck, and Filippo Pennella, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

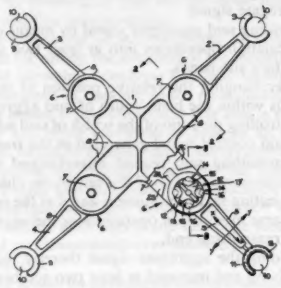
Filed Aug. 25, 1978, Ser. No. 936,954
Int. Cl.³ C07C *3/62*; C10G *29/16*
U.S. Cl. 585—643 **10 Claims**

1. A process for the removal of catalyst poisons from hydrocarbons which comprises contacting under vapor phase conditions a monoolefin-containing hydrocarbon stream contaminated with catalyst poisons with a solid adsorbent selected from the group consisting of the stable oxides of calcium, titanium, zinc and zirconium at a temperature not exceeding about 300° C. and for a period of time sufficient to yield an olefin-containing stream substantially free of said catalyst poisons.

4,188,502
SPACER-DAMPER

Jean-Guy Gagné, Montreal, Canada, assignor to Hydro-Quebec, Montreal, Canada

Filed Dec. 18, 1978, Ser. No. 970,734
Int. Cl.[2] H02G 7/14, 7/12
U.S. Cl. 174—42 **30 Claims**

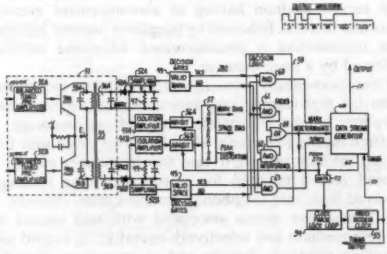


1. A spacer-damper of the type for separating bundled subconductors of a power transmission line and for damping vibrations generated in those subconductors, comprising a metallic frame; a plurality of metallic arms mounted around said frame, each arm having one extremity shaped so as to receive one of said subconductors and another extremity which is connected to said frame by means of a joint; each joint comprising a cheek wherein a ring is fitted, four shoulder means disposed radially and symmetrically on the inner wall of said ring, four pairs of elastomers mounted inside said ring and making a right angle with respect to one another, the elastomers of each pair being spaced from one another by one of said shoulder means, a central pivot set between the pairs of elastomers and inside the ring of said joint, and means for fixing said pivot to said cheek of each joint.

4,188,503
DIGITAL DATA COMMUNICATIONS SYSTEM

Carmine N. Pagano, Newark, and Anthony D. Di'Giorgio, East Brunswick, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 5, 1978, Ser. No. 922,150
Int. Cl.[2] H04L 27/14; H03D 3/00
U.S. Cl. 178—88 **6 Claims**



1. A digital data communications system for reception of mark information of a first frequency and space information of a second frequency, comprising:

a first frequency discriminator means tuned to said first frequency for providing a first output level representative of available mark information;

a second frequency discriminator means tuned to said second frequency for providing a second output level representative of available space information;

a first decision gating circuit means in the output of said first frequency discriminator means for producing one pair of binary outputs indicating the presence and absence, respectively, of a corresponding mark-representative output level;

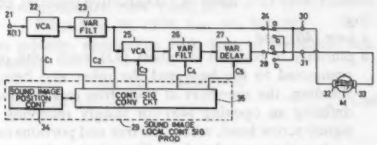
a second decision gating circuit means in the output of said second frequency discriminator means for producing another pair of discrete binary outputs indicating the presence and absence, respectively, of a corresponding space-representative output level; and

decision logic circuit means connected to said pairs of discrete binary outputs of said decision gating circuit means and having a ternary output circuit, and ternary output circuit including a first terminal at which a mark output signal appears during the presence of a mark-representative binary output only, a second terminal at which a space output signal appears during the presence of a space-representative binary output level only, and a third output terminal at which an information indeterminate condition-indicating output signal appears indicative of either the simultaneous presence of mark and space information or the simultaneous absence of mark and space information.

4,188,504
SIGNAL PROCESSING CIRCUIT FOR BINAURAL SIGNALS

Masao Kasuga, Sagamihara; Nobuaki Takahashi, Yamato; Masaaki Sato, Yokohama; Kohji Seki, Ichikawa; Toshinori Mori, Fujisawa, and Makoto Iwahara, Sagamihara, all of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Apr. 25, 1978, Ser. No. 899,892
Claims priority, application Japan, Apr. 25, 1977, 52-47585; Apr. 25, 1977, 52-47586; Apr. 25, 1977, 52-47587; Apr. 25, 1977, 52-47588; May 6, 1977, 52-51862; May 6, 1977, 52-51863
Int. Cl.[2] H04R 5/04
U.S. Cl. 179—1 GP **6 Claims**



1. A binaural signal processing circuit comprising:

first means for imparting an input signal with a first transfer characteristic equal to the transfer characteristic hL (t; θ, r) from a sound source to one of the ears of a listener who is near the sound source, where θ represents an angle between the front direction of the listener and the sound source, and r represents a distance between the sound source and the listener; said first transfer characteristic being variable and corresponding to first control signals applied to said first means;

second means for imparting the input signal with a second transfer characteristic equal to the transfer characteristic hR (t; θ, r) from the sound source to the other ear of the listener, said second transfer characteristic being variable and corresponding to second control signals applied to said second means;

sound image position control device means for producing signals corresponding to coordinates of a position where a sound image is to be localized, wherein the listener lies at the origin of the coordinate system;

control signal conversion means for converting the output

signals of said sound image position control device means into the first and second control signals; and

means for deriving binaural signals from said first and second transfer characteristic imparting means.

4,188,505

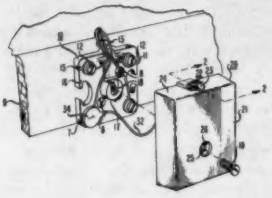
MODULAR JACK CONVERTER

Robert J. O'Connor, Greenfield, Ind., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 10, 1978, Ser. No. 949,410

Int. Cl.[2] H04M *1/00*

U.S. Cl. 179—1 PC **12 Claims**



1. A jack assembly (20) for connecting to a telephone terminal block (10) having a plurality of screw terminals (11) with screw heads (12), where each screw terminal electrically connects to a predetermined one of a plurality of incoming telephone distribution wires (13), the jack assembly being of the type comprising:

a housing (21) made of dielectric material;

a jack (22) included in the housing, the jack having contact elements (27) for forming electrical connection with conductors from a station set or the like; and

a plurality of leads (32) each having a first end (31) and a second end (33), the first end of the leads being electrically connected to respective contact elements (27) and the second ends being electrically connected to connectors (34) which effect electrical contact with the assigned screw terminals, characterized in that each connector comprises:

a contact body (37), made of a conductive material, comprising:

a base (40); and

a plurality of resilient members (42), each with one end connected to the base and the other end being free-standing, the members at their free end portions (45) defining an opening (48) for snugly receiving its assigned screw head, where the free end portions can bear against the screw head to effect electrical connection.

4,188,506

METHOD AND INSTALLATION FOR MASKED SPEECH TRANSMISSION OVER A TELEPHONE CHANNEL

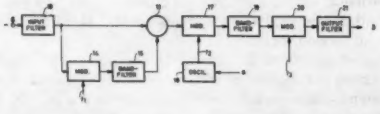
Pierre Schmid, Oberweningen; Eduard Brunner, Oberengstringen, and Walter Stofer, Buchs, all of Switzerland, assignors to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Continuation of Ser. No. 482,873, Jun. 25, 1974. This application May 20, 1976, Ser. No. 688,347

Claims priority, application Switzerland, Jul. 2, 1973, 9627/73

Int. Cl.[2] H04K *1/00, 1/04*

U.S. Cl. 179—1.5 R **26 Claims**



1. A method for the masked or scrambled transmission of spoken information over a telephone channel with the aid of control signals generated at the transmitting end and at the receiving end which comprises the steps of:

(a) dividing the original speech band at the transmitting end into at least two first spectral sub-bands,

(b) delaying one of said sub-bands in time with respect to the other sub-band,

(c) adding the signals of said sub-bands up to provide an aggregate signal,

(d) dividing said aggregate signal by means of a plurality of modulation operations into at least two second complementary sub-bands,

(e) interchanging the relative position of said second sub-bands within the band-width of said aggregate signal,

(f) controlling the ratio of the width of said second sub-bands by said control signal generated at the transmitting end,

(g) transmitting said second interchanged sub-bands as a transmission signal over the telephone channel,

(h) subjecting said transmission signal at the receiving end to the same modulation operations as the aggregate signal at the transmitting end,

(i) dividing the aggregate signal thereby recovered at the receiving end into said at least two sub-bands,

(j) delaying said other sub-band in time with respect to said one sub-band, and

(k) adding said delayed and undelayed sub-bands thereby to form a signal which is at least similar to the original speech signal.

4,188,507

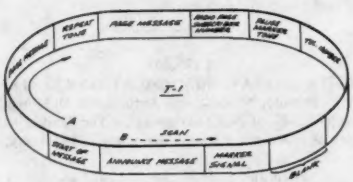
REMOTELY CONTROLLED TELEPHONE ANSWERING APPARATUS

Kalju Meri, Maspeth, and Richard G. Allen, Pound Ridge, both of N.Y., assignors to Dictaphone Corporation, Rye, N.Y.

Filed Aug. 10, 1977, Ser. No. 823,444

Int. Cl.[2] H04M *1/64, 3/42*

U.S. Cl. 179—6 D **28 Claims**



1. Telephone answering apparatus adapted to be coupled to a telephone communication channel, and comprising:

a first record medium having an announcement message recorded thereon, followed by telephone number information representing a predetermined telephone number, followed by a page message;

first transducer means associated with said first record medium for reproducing said announcement message, said telephone number information and said page message;

first drive means selectively energizable to drive said first record medium relative to said first transducer means;

a second record medium for storing incoming messages received from said telephone communication channel;

second transducer means associated with said second recording medium and selectively operative to record said incoming messages thereon and to reproduce recorded messages therefrom;

second drive means selectively energizable to drive said second record medium bidirectionally relative to said second transducer means;

line seizing means actuable in response to an incoming telephone call for seizing said telephone communication channel to operably connect said telephone answering apparatus thereto and for initiating a telephone answering cycle

whereby said first drive means is energized for an announce period such that said announcement message is reproduced and transmitted over said telephone communication channel and then said second drive means is energized to enable an incoming message to be recorded on said second record medium;

means for sensing the termination of said incoming telephone call to de-energize said second drive means and de-actuate said line seizing means;

timing means responsive to the energizing of said second drive means for timing the duration of the incoming message of said incoming telephone call said timing means being de-energized in response to the de-actuation of said line seizing means if said duration is less than a predetermined time and being energized to provide an energize signal if said duration exceeds said predetermined time;

means for applying said energize signal to said line seizing means to re-seize said telephone communication channel and to re-energize said first drive means such that said telephone number information and said page message are reproduced and transmitted over said telephone communication channel;

code detecting means for detecting a first coded signal transmitted over said seized telephone communication channel to said telephone answering apparatus for energizing said second drive means to drive said second record medium such that said recorded incoming messages are reproduced therefrom; and

programmable repeat means selectively operable to re-energize said first drive means and to re-actuate said line seizing means for re-connecting said telephone answering apparatus to said telephone communication channel to transmit said telephone number information and said page message over said telephone communication channel, said repeat means operating either a number of times, preselected as desired, following the completion of an incoming telephone call or until said second drive means is energized, prior to said preselected number of operations, for recording or reproducing incoming messages on said second record medium.

4,188,508

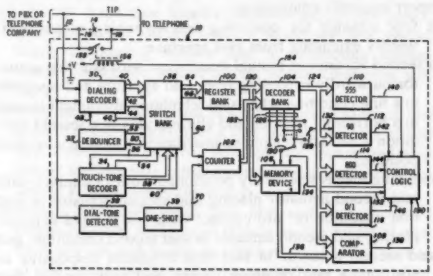
TELEPHONE CALL RESTRICTING APPARATUS

Herbert I. Rogers, 558 Hawthorne Ave., Palo Alto, Calif. 94301; Michael C. Chappelle, 9464 Laguna Cr. Dr., Elk Grove, Calif. 95624; Robert G. Brindle, 915 Burnett, San Francisco, Calif. 94131, and Patrick A. Brindle, Abbey of the Holy Trinity, Huntsville, Utah 84317

Filed Aug. 21, 1978, Ser. No. 935,656

Int. Cl.[2] H04M *1/66*

U.S. Cl. 179—18 DA **8 Claims**



1. A telephone call restricting apparatus for connection to a telephone line for preventing the completion of a toll call by a telephone device connected to the line, the apparatus comprising:

decoder means for connection to the line, said decoder means being responsive to signals develpoed on said line as each digit of a telephone number is dialed including pre-prefix digits, prefix digits, area code digits, central office digits and local number digits and operative to generate decoded digit signals;

means for storing at least some of said decoded digit signals;

means for comparing the decoded digit signals when stored with a prestored list including information relative to whether a predetermined combination of central office digits correspond to a permissible local call, and for developing a first signal when the central office digits portion of said stored digit signals does not correspond to that of a local call;

first detector means for monitoring said stored decoded digit signals and for developing a second signal when the first digit of said stored decoded digit signals corresponds to a "0" or to a "9" followed by a "0";

second detector means for monitoring said stored decoded digit signals and for developing a third signal when the second area code digit of said stored decoded digit signals corresponds to a "0" or a "1";

third detector means for monitoring said stored decoded digit signals and for developing a fourth when the central office digits of said stored decoded digit signals correspond to the number "555";

fourth detector means for monitoring said stored decoded digit signals and for developing a fifth signal when the area code digits of said stored decoded digit signals correspond to the number "(800)";

logic means responsive to said first signal or said second signal and operative to develop a sixth signal and responsive to said third signal and operative to develop said sixth signal in the absence of said fourth signal and said fifth signal; and

means responsive to said sixth signal and operative to abort the call so as to prevent completion of a toll call.

4,188,509

TONE SIGNALLING ARRANGEMENT FOR A TELECOMMUNICATIONS EXCHANGE

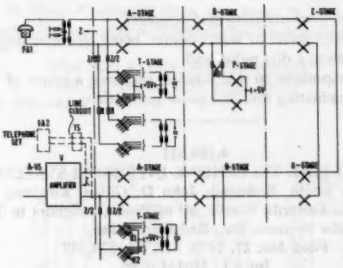
Peter Münchow, Stuttgart, and Walter Kaiser, Leinfelden, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 28, 1978, Ser. No. 937,287

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1977, 2740104

Int. Cl.[2] H04M *3/58*

U.S. Cl. 179—18 AD **7 Claims**



1. A multiple stage, processor controlled crosspoint switching network having an inlet side for coupling to stations and an outlet side for folding connection through the network to complete a path therethrough, an auxiliary crosspoint stage for tone transmission coupled in parallel with a first stage of the network and coupled to the inlet side of the network, a source of tones coupled to said auxiliary stage to pass tone signals through crosspoints of the auxiliary stage to a station coupled

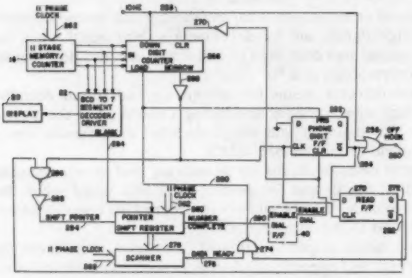
to the inlet side of said network, and in which there are terminating resistors of said auxiliary stage coupled to said inlet side of the network.

4,188,510

TELEPHONE SEQUENTIAL NUMBER DIALER WITH NUMBER INCREMENTING

David S. Bower, Sunrise, and Fred J. Smith, Plantation, both of Fla., assignors to Digital Products Corporation, Fort Lauderdale, Fla.

Division of Ser. No. 799,141, May 23, 1977. This application Jul. 3, 1978, Ser. No. 921,561
Int. Cl.[2] H04M *1/27*
U.S. Cl. 179—90 BD **5 Claims**



1. Automatic telephone dialing apparatus comprising:
means for storing a telephone number to be called;
a counter;
a shift register having a leading end and a trailing end, the number of bit positions in said shift register being one more than the maximum number of digits to be dialed;
means for inserting in said shift register a plurality of consecutive ONES starting at said leading end, the number of ONES equaling the difference between the number of shift register bit positions and the number of digits of the telephone number to be called;
means for scanning said shift register bit positions starting at the leading end;
means for inserting into said counter from said storing means the digits of the stored telephone number in sequence in synchronism with the scanning of said shift register whenever a ONE is detected in a bit position of said shift register;
means for decrementing said counter;
means responsive to said counter being decremented for generating a dial pulse; and
means responsive to said counter reaching a count of zero for terminating said dial pulse generation.

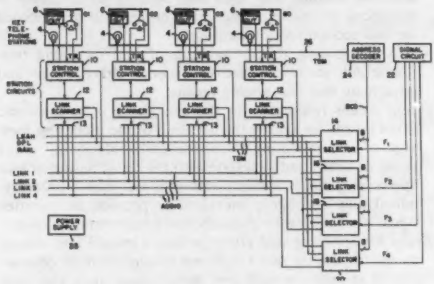
4,188,511

MULTI-LINK TELEPHONE INTERCOM SYSTEM

Maurice I. Smith, Redmond; John D. Gillen, Kirkland, and Gerald L. Edwards, Seattle, all of Wash., assignors to Tone Commander Systems, Inc., Redmond, Wash.

Filed Jan. 27, 1978, Ser. No. 873,157
Int. Cl.[2] H04M *9/06*
U.S. Cl. 179—99 A **20 Claims**

1. A communication system for providing communication between a plurality of stations, the system comprising: means providing a plurality of communication links; a plurality of station circuits respectively operable with separate stations, each said station circuit including link scanner means for seizing an available link, and effecting a connection with a seized link; and a plurality of link selector circuits respectively associated with separate links, each said link selector circuit including means responsive to seizure of its associated link by a calling station link scanner for causing a called station link



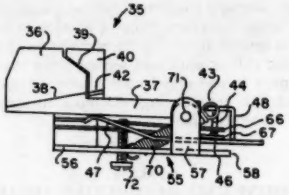
scanner to effect connection with the link seized by the calling station link scanner.

4,188,512

TELEPHONE HOOKSWITCH ACTUATOR AND HANDSET SUPPORT ASSEMBLY

John M. Lord, Bensenville, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Nov. 22, 1978, Ser. No. 962,818
Int. Cl.[2] H04M *1/08*
U.S. Cl. 179—100 C **8 Claims**



1. An actuator and support assembly for use in a telephone instrument allowing said telephone instrument to be usable in a horizontal or alternatively a vertical position, said telephone instrument including a handset unit having receiving means thereon, a base unit having a top surface arranged to accept said handset unit and an aperture in said top surface and including switching means within said base unit, said actuator and support assembly comprising:
a first actuator for operating said switching means, outwardly extending from said aperture;
a second actuator in mutual association with said first actuator outwardly extending from said aperture and operable in a first condition when said telephone instrument is used in a horizontal position and alternatively in a second condition when said telephone instrument is used in a vertical position;
retaining means selectively positionable out of contact with said second actuator placing said second actuator in said first condition or into contact with said second actuator placing said second actuator in said second condition; and
said second actuator in said first condition responsive to positioning said retaining means, and said handset unit manually positioned on said base unit top surface, to displace said first actuator inwardly, operating said switching means and said second actuator simultaneously following said first actuator, and alternatively said second actuator in said second condition responsive to positioning said retaining means, and said handset unit manually positioned on said base unit top surface, to displace said first

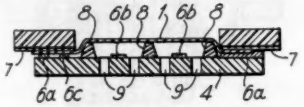
actuator inwardly operating said switching means and said second actuator retained outwardly to accommodate said handset unit receiving means thereon supporting said handset unit on the base unit.

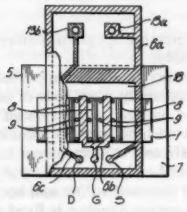
4,188,513

ELECTRET MICROPHONE WITH SIMPLIFIED ELECTRICAL CONNECTIONS BY PRINTED CIRCUIT BOARD MOUNTING

Ronald J. Morrell, Romoka; Beverley W. Gumb, and Algirdas J. Dragunevicius, both of London, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Nov. 3, 1978, Ser. No. 957,539
Int. Cl.[2] H04R *19/04*
U.S. Cl. 179—111 E **15 Claims**





1. An electret microphone assembly comprising:

a first circuit board having a first conducting pattern on an obverse surface thereof and at least one perforation therethrough;

a second circuit board having a second conducting pattern on an obverse surface thereof and at least one perforation therethrough;

an electret diaphragm located between said circuit boards with a charged surface thereof facing the first circuit board conducting surface and a conducting surface thereof facing the second circuit board conducting surface;

spacing means adjacent said first circuit board to space one portion of the electret from a first conducting area of said first conducting pattern, said spacing means and said spaced electret part being accommodated in the perforation of at least one of the boards; and

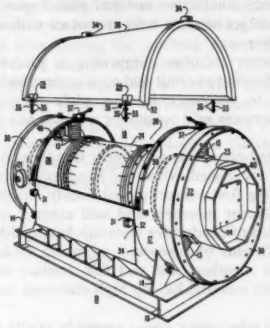
clamping means clamping said first and second circuit boards together said circuit boards having matched contours at a junction region, in which region another portion of said electret is clamped to mount said one portion of the electret over the spacing means and in which region said conducting patterns electrically contact and cooperate with said electret conducting surface to electrically connect first and second terminals located on the reverse side of one of the circuit boards respectively to the first conducting area and to the electret conducting surface.

4,188,514

TELESCOPING DISCONNECT SWITCH WITH GASKETED COVERED ACCESS PORT

Jayant M. Patel, Cincinnati, Ohio; Jerome K. Wolfe, Murrysville, and Paul P. Koren, North Strabane Township, Washington County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 1, 1978, Ser. No. 956,815
Int. Cl.[2] H02B *1/08;* **H01H** *9/02, 31/00*
U.S. Cl. 200—48 R **9 Claims**



1. An isolated phase bus disconnect switch comprising:

a housing of conductive material, said housing comprising an access port for maintenance and inspection;

a fixed center conductor disposed within said housing and electrically insulated therefrom;

a movable center conductor disposed within said housing and electrically insulated therefrom, said movable conductor cooperating with said fixed conductor to perform a switching function therewith;

a cover of conductive material removably covering said access port;

a conductive gasket of metal braid disposed between said housing and said cover; and

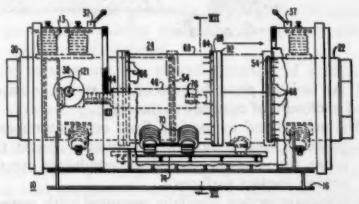
means for applying contact pressure upon said cover, said conductive gasket, and said housing to provide a low resistance electrical path therethrough.

4,188,515

TELESCOPING DISCONNECT SWITCH WITH LOW RESISTANCE CENTER CONDUCTOR

Jayant M. Patel, Cincinnati, Ohio, and James R. Farley, Plum Borough, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 1, 1978, Ser. No. 956,818
Int. Cl.[2] H01H *1/04, 1/06, 51/02*
U.S. Cl. 200—48 R **7 Claims**



1. A conductor assembly for a telescoping disconnect switch, comprising:

a conductor member constructed of a first conductive mate-

rial having a first thermal coefficient of expansion and adapted for fixed series connection to an electrical circuit being switched;

a contact member constructed of a second conductive material having a second thermal coefficient of expansion and adapted for separable series connection to an electrical circuit being switched, said contact member being fixedly connected to said conductor member;

low-resistance conductive material plated upon the portion of said conductor member held in contact with said contact member; and

low-resistance conductive material plated upon the portion of said contact member held in contact with said conductor member;

said conductor member comprising a plurality of slots formed therein to permit said conductor member to flex in response to resistance heating while reducing relative motion between said conductor member and said contact member.

4. An isolated phase bus disconnect switch, comprising:

a pair of axially spaced cylindrical fixed conductor members, each having first contact means fixedly attached thereto, said conductor members and said contact means being constructed of conductive materials having different thermal coefficients of expansion, adjoining surfaces of said conductor members and said first contact means being plated with material having high electrical conductivity; and

a cylindrical telescoping sleeve assembly axially movable to bridge said fixed conductor members, said assembly comprising a cylinder and a pair of second contact means, each of which is fixedly attached to respective ends of said cylinder and adapted to establish electrical contact with said first contact means, said cylinder and said second contact means being constructed of material having different thermal coefficients of expansion, adjoining surfaces of said cylinder and said second contact means being plated with material having high electrical conductivity;

said fixed conductor members and said cylinder each comprising a plurality of axially extending slots.

4,188,516

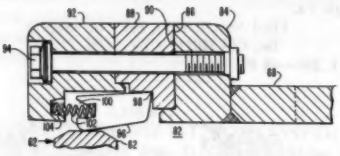
TELESCOPING DISCONNECT SWITCH WITH HIGH CURRENT CONTACT SYSTEM

Jayant M. Patel, Cincinnati, Ohio; Jerome K. Wolfe, Murrysville, and Forrest E. Coyle, Penn Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 1, 1978, Ser. No. 956,819

Int. Cl.[2] H01H *1/38, 1/46, 31/00*

U.S. Cl. 200—48 R **10 Claims**



1. An isolated phase bus disconnect switch, comprising:

an enclosure of conductive material;

first and second cylindrical fixed conductor members disposed in said enclosure and axially spaced from each other, the adjacent ends of said conductor members comprising contact surfaces;

a telescope section coaxially mounted with respect to said fixed conductor members within said enclosure and axially movable to bridge said fixed conductor members;

a plurality of individual contact fingers circumferentially positioned around the ends of said telescope section and cooperating with said contact surfaces to establish electrical contact therewith;

annular means fixedly attached to said telescope section for removably securing said contact fingers to said telescope section and for positioning said contact fingers in axial and radial directions; and

a plurality of stabilizer pads located about the circumference of said annular means and fixedly attached thereto, said pads positioning said contact fingers in the circumferential direction.

4,188,517

COLLISION DETECTING INERTIA SWITCH

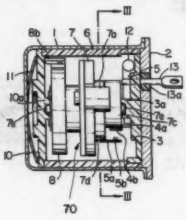
Selichi Narita, Toyohashi, and Norio Kumita, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 23, 1978, Ser. No. 936,097

Claims priority, application Japan, Sep. 23, 1977, 52-128653[U]

Int. Cl.[2] H01H *35/10*

U.S. Cl. 200—61.45 R **6 Claims**



1. A collision detecting apparatus comprising:

a housing assembly;

a rotational member rotatably supported by a shaft within said housing assembly, both ends of said shaft being supported by said housing assembly, said rotational member comprising a weight member positioned eccentrically from said shaft and cam members having cam profiles formed on peripheral surfaces thereof;

a spring member disposed within said housing assembly, one end of which spring member is fixed to said housing assembly and the other end of which spring member is fixed to a portion of said rotational member, thereby applying a counteracting rotational force to said rotational member depending on an angle of rotation through which said rotational member has rotated;

electrical contact means disposed within and fixed to said housing assembly and actuated by said cam members of said rotational member to be opened or closed when the rotation of said rotational member reaches a predetermined angle of rotation; and

means for holding said housing assembly together.

4,188,518

MINIATURE ELECTRICAL PUSH BUTTON CONTACTOR

Christian du Temple de Rougemont, Paris, France, assignor to Isostat, Cucq, France

Continuation of Ser. No. 804,396, Jun. 7, 1977, abandoned. This application Dec. 4, 1978, Ser. No. 965,751

Claims priority, application France, Jun. 16, 1976, 76 18206

Int. Cl.[2] H01H *3/12, 1/18*

U.S. Cl. 200—159 R **8 Claims**

1. An electrical push button contactor comprising:

(a) a base having an inner axial recess;

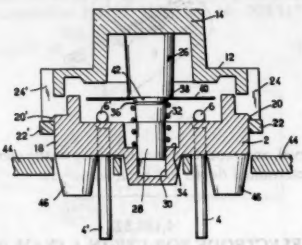
(b) a button telescopically mounted on said base and formed with an axially inwardly projecting guide post which is stepped down in diameter to provide two longitudinally spaced inwardly facing annular shoulders separated by a

short intermediate post length portion which terminates in an axial post extension having a sliding fit in said inner recess of said base;

(c) spring means surrounding said extension and positioned between said inner recess of said base and the lower shoulder of said post for normally biasing said button away from said base;

(d) at least two spaced stationary contact members positioned within said base and having portions extending outwardly therefrom;

(e) a movable contact member comprising a flexible, resilient, ring-shaped disc positioned on said intermediate post length for bridging said stationary contact members; the inner diameter of said disc being greater than the diameter of said intermediate post length portion but smaller than



the diameter of the upper annular shoulder and also smaller than the outer diameter of said spring means;

whereupon further movement of said movable contact member in the same direction as causes said movable member to contact said stationary members tends to flex said movable contact member thereby providing a wiping action between said movable contact member and said stationary contact members; and

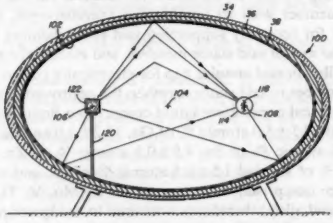
(f) abutment means for stopping said further movement of said movable contact member when the flexion thereof has attained a predetermined degree at which the movable contact member exerts on each of said stationary contact members a contact pressure at least equal to the requisite minimum contact pressure even where the effective contact areas of said stationary contact members lie at different heights relative to said base.

4,188,519

PROCESS AND APPARATUS FOR CONTROLLABLY EXCHANGING HEAT BETWEEN TWO BODIES

Charles A. Berg, Buckfield, Me., assignor to Pyreflex Corporation, Buckfield, Me.

Filed Mar. 20, 1978, Ser. No. 888,212
Int. Cl.[2] H05B *9/02, 11/00*
U.S. Cl. 219—10.47 **23 Claims**



1. Apparatus for conserving heat in a system wherein a plurality of workpieces are sequentially transported by a conveyor means through a heating station and a working station and are subsequently cooled, said apparatus comprising:

a tunnel having a longitudinal axis parallel to which workpieces are transported by portions of said conveyor means prior to entering the heating station and after exiting the working station in a heated condition,

said tunnel having an interior infrared radiation reflective surface which, in planes perpendicular to the axis, describes an ellipse having a pair of separated foci,

the portions of said conveyor means passing through said tunnel being located adjacent said foci so that workpieces on the conveyor means prior to entering the heating station and after exiting the working station pass along respective focal lines in said tunnel,

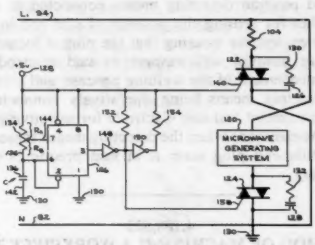
said apparatus being operable to transfer heat from workpieces exiting from the working station to workpieces entering the heating station by reflecting infrared radiation emitted by exiting workpieces at the interior surface and directing said radiation at the focal line along which entering workpieces pass.

4,188,520

EFFECTIVE CONCURRENT MICROWAVE HEATING AND ELECTRICAL RESISTANCE HEATING IN A COUNTERTOP MICROWAVE OVEN

Raymond L. Dills, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed May 31, 1978, Ser. No. 911,555
Int. Cl.[2] H05B *9/06*
U.S. Cl. 219—10.55 B **8 Claims**



1. A cooking oven having both microwave and electrical resistance heating capabilities, which is adapted for operation from a power source insufficient to supply both the microwave and electrical resistance heating capabilities simultaneously at their respective full rated power levels, and wherein effective microwave and electrical resistance heating can be accomplished concurrently without exceeding the power source capability, said oven comprising:

means for establishing the overall duration of a cooking operation;

a microwave energy generating system;

an electrical resistance heating element;

duty cycle power control means for periodically energizing said microwave energy generating system from the power source, said microwave energy generating system being energized a plurality of times during each cooking operation; and

means for energizing said electrical resistance heating element only during those periods when said microwave energy generating system is not energized.

4,188,521

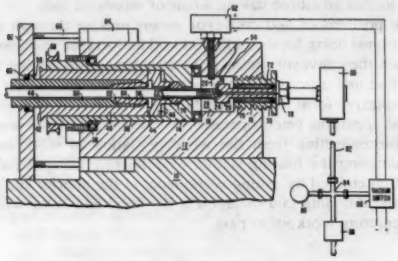
APPARATUS FOR WELDING AN END PLUG IN A NUCLEAR FUEL TUBE

Denis Yeo, Columbia, S.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 15, 1977, Ser. No. 824,592

Int. Cl.[2] B23K *37/04*

U.S. Cl. 219—60 A **5 Claims**



1. Apparatus for controlling the position of a fuel tube-end plug seam on a fuel rod relative to a stationary welding electrode in a welding chamber comprising:

a housing having a welding chamber therein, said chamber being arranged to communicate with a bore in the housing which contains means for grasping and rotating a fuel rod and for sealing the end plug side of the fuel rod in the welding chamber to thereby prevent leakage of gas therefrom during a welding operation;

a stop member in said welding chamber positioned to be engaged by the end plug on said fuel rod, the distance being arranged such that when the end plug is seated in the stop member, the fuel tube-end plug seam is precisely positioned with respect to a stationary electrode in the welding chamber;

fuel rod position detecting means connected to said stop member for sensing the position of said rod in the stop member, and for assuring that the plug is located in said precise position with respect to said electrode before commencement of the welding process; and

said detecting means being operatively connected to an electric circuit and said electrode for selectively energizing the electrode when the detecting means senses that the fuel tube-end plug seam is in said precise position for welding.

4,188,522

METHOD OF MACHINING A WORKPIECE TO A PREDETERMINED DEPTH USING A MACHINING PROCESS IN WHICH MACHINE TOOL WEAR OCCURS

George E. Baker, Ashfordby, near Melton Mowbay, England, assignor to Amchem Company Limited, Sileby, England

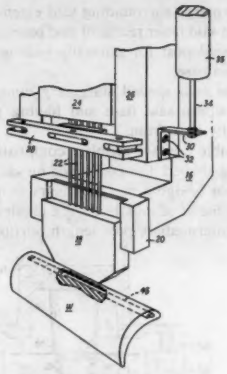
Continuation-in-part of Ser. No. 739094, Nov. 5, 1976, abandoned. This application Nov. 15, 1977, Ser. No. 851,788

Claims priority, application United Kingdom, Nov. 6, 1975, 46117/75

Int. Cl.[2] B23P *1/00*

U.S. Cl. 219—69 M **5 Claims**

1. A method of machining a workpiece to a predetermined depth using an electrical discharge machining process in which machine tool wear occurs and wherein said machine tool includes a plurality of electrodes, said method comprising utilizing the machine tool machining a workpiece to a first level less than a predetermined depth to which the machine tool is to progress, withdrawing the machine tool from the workpiece, refeeding the machine tool by the steps of inserting a refeed member having a surface matched to that of the workpiece being machined over a bore being machined into the workpiece by each electrode, aligning the electrodes on the surface of the refeed member, clamping each electrode in the aligned position, raising each electrode on a machine head and removing the refeed member, machining the workpiece to a



second level, and repeating the refeeding of the electrodes until the predetermined depth has been achieved.

4,188,523

ROLL ELECTRODE FOR USE IN A SEAM WELDING MACHINE

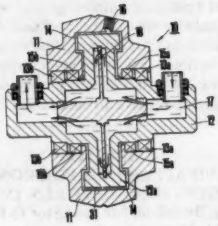
Jun Kawai; Jun-ichi Homma; Saburo Watanabe, all of Tokyo, and Masahiro Watanabe, Yokohama, all of Japan, assignors to Nippon Electric Co., Ltd. and Fuji Industry Co., Ltd., both of Yokohama, Japan

Filed Jun. 15, 1978, Ser. No. 915,746

Claims priority, application Japan, Jun. 15, 1977, 52-71371; Jun. 15, 1977, 52-71372; Jul. 27, 1977, 52-90701; Jul. 27, 1977, 52-90702; Jul. 27, 1977, 52-90703; Jul. 27, 1977, 52-90704

Int. Cl.[2] B23K *11/06;* **H01R** *39/30;* **C22C** *28/00*

U.S. Cl. 219—83 **8 Claims**



1. In a roll electrode for use in a seam welding machine comprising a stator member, a rotor member surrounding said stator member with an annular gap therebetween, a bearing member for rotatably supporting said rotor member to rotate about the axis of said stator member, and electrical conductive liquid filled in said annular gap for electrically connecting said rotor member to said stator member, the improvement wherein said electrical conductive liquid comprises a liquid metal consisting of 69.5±5.0 atomic % of Ga, 15.2±1.0 atomic % of In, 6.1±1.0 atomic % of Sn, 4.5±0.8 atomic % of Zn, 3.2±0.5 atomic % of Ag and 1.5±0.5 atomic % of Al, and wherein a substance comprising one or more of W, Mo, V, Ti, mixture thereof and alloys therefrom is secured to the lower portion of the outer surface of said stator member which defines said annular gap.

6. A method of operating a seam welding machine including a water cooled roll electrode filled with an electroconductive

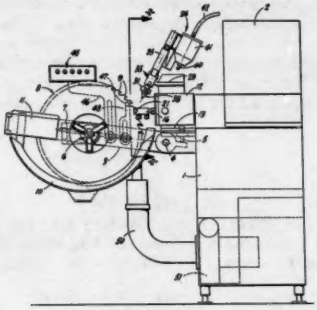
liquid metal, said method comprising the steps of passing welding current of a predetermined value through said roll electrode for a predetermined time before commencing welding operation, operating said welding machine by passing said welding current and cooling water through said roll electrode, stopping the operation of said welding machine and then passing a constant current having a value of from 0.01 to 0.1% of said welding current through said roll electrode for a predetermined time.

4,188,524

METHOD OF BRAZING TIPS ON CIRCULAR SAW TEETH

Luigi Trinchera, Stockton, Calif., assignor to California Cedar Products Company, Stockton, Calif.

Division of Ser. No. 678,160, Apr. 19, 1976, Pat. No. 4,110,591.
This application Jul. 17, 1978, Ser. No. 925,117
Int. Cl.[2] B23K *1/02*
U.S. Cl. 219—85 CM **7 Claims**



1. A method of brazing a tip on the tooth of a movably mounted, circular saw blade comprising the sequential steps of clamping an initially separate tip between two opposed electrodes interposed in an electrical resistance circuit, closing the circuit whereby the clamped-in-place tip is heated, opening the circuit, delivering a quantity of brazing paste onto the heated tip, moving the circular saw blade until a selected tooth thereof bears on the clamped-in-place tip, and again closing the circuit whereby the tip is re-heated and brazes to the tooth.

4,188,525

WELDING TORCH OSCILLATION APPARATUS

George J. Merrick, Franklin; George E. Cook, Brentwood, and Donald D. Modglin, Nashville, all of Tenn., assignors to Merrick Welding International, Nashville, Tenn.

Division of Ser. No. 654,975, Feb. 3, 1976, Pat. No. 4,145,593.
This application Dec. 5, 1977, Ser. No. 857,359
Int. Cl.[2] B23K *9/12*
U.S. Cl. 219—125.12 **3 Claims**

1. Apparatus for oscillating a welding torch across a weld path, comprising:

means for supporting a welding torch in relation to a weld path;

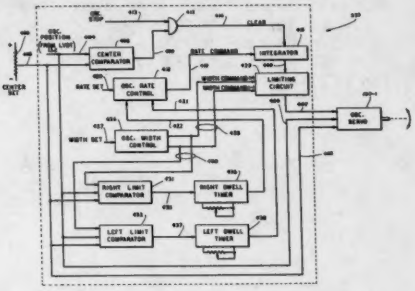
motive means operatively connected to move said torch support means laterally of the weld path in a selected first or second direction and at a selected rate of movement;

position sensing means responsive to the lateral position of said torch support means to provide a location signal corresponding to said lateral torch position;

position control means responsive to an input command signal to provide said motive means with position command signals which cause said torch support means to move alternately in first and second lateral directions at a predetermined rate;

center adjustment means operative to provide a selectably variable center signal corresponding to a selectably variable center location of said torch support means at a selected location on the path of said lateral movement;

center coincidence means responsive to said selectively variable center signal and to said location signal from said position sensing means to provide a center coincidence signal in response to signals indicating that said torch support means is at said selected center location; and



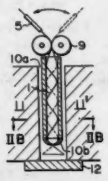
center stop means operative in response to the occurrence of said center coincidence signal in the presence of an oscillation stop signal to interrupt said position command signal and to maintain said center signal, so that said torch support means stops at said variable center location on said path of lateral movement in response to said oscillation stop signal.

4,188,526

NARROW WELD-GROOVE WELDING PROCESS

Isao Asano, Kure, Japan, assignor to Babcock-Hitachi Kabushiki Kaisha, Japan

Filed Mar. 11, 1977, Ser. No. 776,921
Claims priority, application Japan, Mar. 15, 1976, 51/27178; Jul. 22, 1976, 51/96881; Jul. 27, 1976, 51/88685; Sep. 27, 1976, 51/114675; Oct. 19, 1976, 51/124494; Oct. 19, 1976, 51/124495; Nov. 22, 1976, 51/139556
Int. Cl.[2] B23K *9/00*
U.S. Cl. 219—137.8 **11 Claims**



1. In a narrow weld-groove welding process, wherein a bare welding wire is fed through a contact tube into a weld groove defined between opposed surfaces of two pieces of metal, and then an arc is caused therebetween, while moving the contact tube along the weld groove, for melting the bare welding wire to thereby effect the welding of the metals,

the improvement comprising the steps of:

rocking, with respect to a motor-driven roller means for feeding the welding wire to the contact tube, a welding wire feeding means adapted to guide the welding wire to said roller means;

forcing the welding wire upon the outer periphery of rollers in the roller means to thereby impart a wavy plastic deformation to said welding wire; and

feeding the plastically deformed wire into the contact tube by means of said roller means immediately after imparting

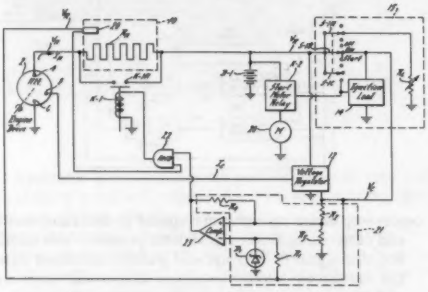
the deformation to the welding wire, while preventing contact between said wire and any structure other than said contact tube and preventing apexes of the deformed wire from appearing outside of the contact tube in a space between the roller means and the contact tube.

4,188,527

AUTOMOTIVE ELECTRIC QUICK HEAT SYSTEM

William C. Follmer, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 21, 1977, Ser. No. 862,705
Int. Cl.[2] B60L *1/02*
U.S. Cl. 219—202 **11 Claims**



1. In an automotive electrical system, including a storage battery, a mechanically driven alternator having a rectified DC voltage output, a voltage regulator electrically connected between a voltage terminal of said battery and field coil of said alternator, and a voltage regulated load connected in parallel with said battery;

an improvement comprising:

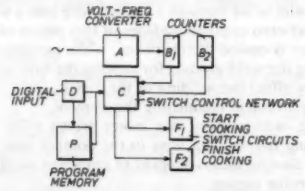
a resistive load connected between said DC voltage output of said alternator and said voltage regulated terminal of said battery and means connected in parallel with said resistive load for selectively shunting said resistive load in response to a control signal.

4,188,528

ELECTRONIC CONTROL DEVICE FOR ELECTRIC RANGES

Dieter Wierzchowski; Klaus Fischer, both of Nüremberg; Günther Formanek, Grosshabersdorf, and Leonhard Scheumann, Nüremberg, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt, Fed. Rep. of Germany

Filed Feb. 2, 1977, Ser. No. 764,960
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1976, 2605533
Int. Cl.[2] H05B *1/02*
U.S. Cl. 219—490 **5 Claims**



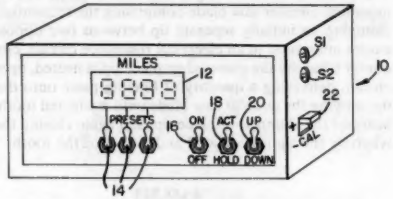
1. In an electronic control device for an electric cooking appliance including at least one heating element arranged to be supplied with electric power for heating at a selected one of a plurality of different heat settings corresponding to respectively different heating levels, and digital input means for controlling the power supplied to the element in accordance with a selected heat setting by causing power pulses having a respectively different power-on to power-off ratio for each heat setting to be supplied to the element, the improvement comprising switching means connected for supplying in sequence to the element, at each heat setting, initial heating power, at the start of a heating operation, which is supplied continuously, and has a constant power level, for a selected time duration and, after the selected duration, a train of pulses of heating power having a selected, constant pulse duration and pulse repetition rate, said switching means including: control means connected to said input means for responding to the selected heat setting for causing the train of pulses to have the same repetition rate at all heat settings and for causing both the duration of each pulse of the pulse train and the duration of the initial heating power to differ from one heat setting to another; a first counter for producing output signals defining the pulse repetition rate of a train of pulses; a second counter for producing output signals defining the duration of each pulse of a train of pulses; and a voltage-frequency converter connected to monitor the voltage of the electric power supplied to the appliance and connected to said second counter for varying its counting rate as a function of changes in that voltage.

4,188,529

ELECTRONIC CB TWENTY METER

Nathaniel E. Schochat, 620 Forest Hill Rd., Macon, Ga. 31210, and Fred L. Martin, 8101 Elderberry Dr., Knoxville, Tenn. 37919

Filed Apr. 18, 1978, Ser. No. 897,542
Int. Cl.[2] H03K *21/36;* G06F *15/20*
U.S. Cl. 235—92 DN **3 Claims**



1. An electronic indicator for maintaining the exact mile post position of a vehicle in relation to mile post indicators comprising:

(a) pulse means for generating a pulse based upon the distance travelled by the vehicle;

(b) electronic counter means connected to said pulser means for counting the pulses generated by said pulser means and converting said pulses to BCD outputs;

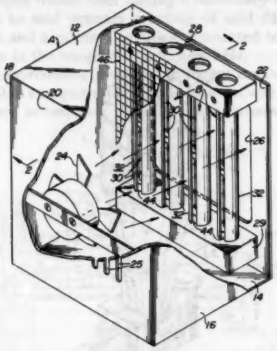
(c) display means connected to said electronic counter means for displaying the count present in said counter as a mileage position indicator; and

(d) calibration means connected between said pulser means and said electronic counter means, said calibration means operating in either a positive or negative mode and including pulse inhibiting means for preventing a number of the pulses generated by said pulser means to be presented to said electronic counter means when the calibration means is operating in its negative mode and pulse generating means for presenting additional pulses to said electronic counter means when said calibration means is operating in its positive mode.

4,188,530
LIGHT-SHIELDED EXTENDED-RANGE STATIC ELIMINATOR

Bruce H. Miller, Hatfield, Pa., assignor to The Simco Company, Inc., Lansdale, Pa.

Filed Nov. 14, 1978, Ser. No. 960,578
Int. Cl.[2] H01T *19/04;* H01J *27/00*
U.S. Cl. 250—324 6 Claims

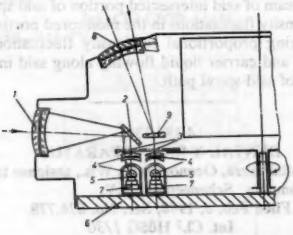


1. A light-shielded, extended-range static eliminator for impinging a stream of ionized air upon light sensitive articles to be neutralized comprising a housing having an opening therein, blower means for directing a stream of air through the opening, a plurality of discharge electrodes supported in said housing across the opening thereof so that the electrodes face in an opposite direction to the air stream, including means for coupling said discharge electrodes to one side of an A.C. high voltage source, and a generally tubular conductive casing connected to the other side of the high voltage power source and at least partially encircling said means for coupling so as to shield the high voltage field thereof from ions emitted in the air gap between said discharge electrodes and said conductive casing and further shielding the articles exposed to the ionized air stream from corona developed in the air gap.

4,188,531
APPARATUS FOR SCANNING AN AIR SPACE FOR DETECTING LOW-FLYING AIRPLANES AND FLYING BODIES

Günter Pusch, Bannholzweg 12, 6903 Neckargemund-Dilsberg, Fed. Rep. of Germany

Filed Sep. 1, 1977, Ser. No. 829,674
Int. Cl.[2] H01J *31/49*
U.S. Cl. 250—334 8 Claims

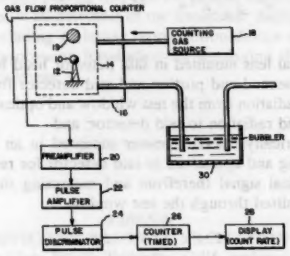


1. In a device for scanning an air space to detect low-flying objects comprising objective lens means distributed over a surface for scanning the air space and producing images thereof, modulation means for modulating the images of the scanned air space from said objective lens means to discriminate the presence of a target, and detector means receiving the modulated images for indicating the presence of a discriminated target and the location thereof, the improvement wherein said modulation means comprises a planar disc with a modulation screen thereon, and optical deflecting means for deflecting light rays coming from said objective lens means to said planar disc in a path perpendicular to said disc.

4,188,532
METHOD FOR THE NON-DESTRUCTIVE ASSAYING OF LASER FUSION TARGETS

Harry W. Deckman, Fanwood, and Gerald M. Halpern, Somerville, both of N.J., assignors to The University of Rochester, Rochester, N.Y.

Filed Jan. 30, 1978, Ser. No. 873,567
Int. Cl.[2] G01J *1/00*
U.S. Cl. 250—336 3 Claims



1. The method of measuring the content of active fuel material in a laser fusion target which comprises the steps of measuring the flux of beta particles emitted by said target by counting the rate at which said beta particles are emitted, said content being the mass of said active material of said target, and dividing said count rate by the product of the escape probability of said particles from said target (P), the efficiency of counting (ϵ), and the specific activity of said active material (A), said target being a hollow shell containing a gas including tritium gas under pressure greater than atmospheric pressure therein as said active material, and subtracting the contribution to the measured count rate from tritium trapped in said shell, S, prior to said dividing step to obtain the mass of said tritium.

4,188,533
WINDOW TRANSMITTANCE TESTER

Ernest W. Ashenfelter, Wichita; Fred M. Dickey, Derby, and Jerry R. White, Wichita, all of Kans., assignors to The Boeing Company, Wichita, Kans.

Filed Jan. 9, 1978, Ser. No. 867,794
Int. Cl.[2] G01J *1/00*
U.S. Cl. 250—338 10 Claims

1. A window transmittance tester for testing the infrared radiation transmission through a test window, the tester comprising:

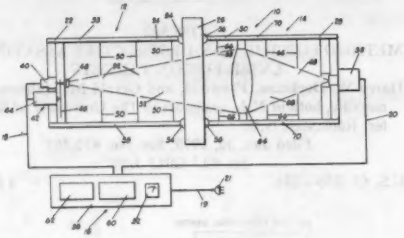
a hand held self-contained portable radiation source head having a first end portion and an open second end portion, the open second end portion of the said head disposed adjacent and tangent the test window;

a radiation source connected to an electrical power source and mounted in the first end portion of said radiation source head, said radiation source directed through said head outwardly through the open second end portion of said head and through the test window, said radiation source providing a spectral range of radiation;

a hand held self-contained portable detector head having a first end portion and an open second end portion, the open second end portion of said detector head disposed adja-

cent and tangent the test window and on the opposite side of the test window from the second end portion of said radiation source head and in alignment therewith;

a detector connected to an electrical power sorce and mounted in the first end portion of said detector head for receiving said radiation through the test window and converting said radiation to an electrical signal;



an optical lens mounted in said detector head between the open second end portion and said detector for receiving said radiation from the test window and optically conveying said radiation to said detector; and

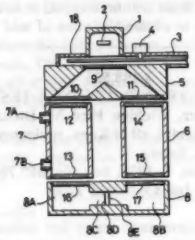
an electrically operated meter mounted in an electronics housing and connected to said detector for receiving the electrical signal therefrom and measuring the radiation transmitted through the test window.

4,188,534

INFRARED GAS ANALYZER

Atsuo Watanabe; Hidenori Ishizawa, and Masahiro Uno, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 20, 1978, Ser. No. 898,045
Int. Cl.² G01N *21/26*
U.S. Cl. 250—345 **8 Claims**



1. An infrared gas analyzing device of the type comprising a light source portion, a cell portion having measuring and reference cells and a detector portion and wherein said light source portion comprises a light source and a light divider, the latter having an inlet opening in a surface facing said light source for receiving light emitted from said light source and first and second light passages having center axes and communicating with said inlet opening for supplying separate beams of light to said measuring and reference cells, respectively, wherein the improvement comprises:

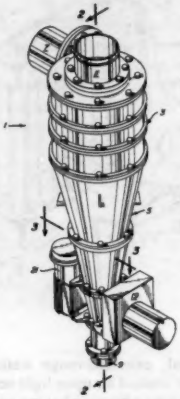
the center axes of said first and second light passages intersecting at said light source.

4,188,535

METHOD AND APPARATUS FOR MONITORING DENSITY FLUCTUATIONS IN MATERIAL FLOWING SPIRALLY WITHIN A HYDROCYCLONE

Peter C. Wilson, and Robert P. Hughart, both of 2045 W. 9th Ave., Denver, Colo. 80204

Filed Nov. 3, 1977, Ser. No. 848,024
Int. Cl.² G01N *23/00*
U.S. Cl. 250—359 **46 Claims**



1. A method for monitoring density fluctuations in a flow of material and carrier liquid moving along a substantially symmetrical spiral path within a cyclone separator, said cyclone separator having an inlet and at least first and second outlets whereby material being conveyed in said carrier liquid enters said cyclone separator through said inlet in response to a pressure differential set up between said inlet and said first and second outlets, moves along said spiral path within said cyclone separator toward said first outlet, and has a portion thereof separated from said carrier liquid, said separated portion of said material exiting said cyclone separator through said first outlet and said separated carrier liquid and remaining portion of said material exiting said cyclone separator through said second outlet, said spiralling flow of material and carrier liquid further creating an air column within said hydrocyclone extending substantially along a portion of the axis of symmetry of said spiral path, said method comprising the steps of:

(a) providing a source of radiation,

(b) directing a beam of said radiation along a path intersecting at least a portion of said spiral path and spaced from said air column, and,

(c) monitoring fluctuations in the intensity of at least a portion of said beam at a location along said radiation path downstream of said intersected portion of said spiral path, said intensity fluctuations in the monitored portion of said beam being proportional to density fluctuations in the material and carrier liquid flowing along said intersected portion of said spiral path.

4,188,536

DENTAL X-RAY APPARATUS

Dennis G. DallaPiazza, Oconomowoc, Wis., assignor to General Electric Company, Schenectady, N.Y.

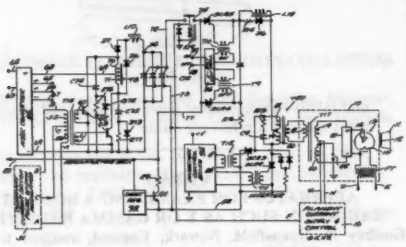
Filed Feb. 3, 1978, Ser. No. 874,778
Int. Cl.² H05G *1/30*
U.S. Cl. 250—402 **1 Claim**

1. Dental x-ray apparatus comprising a housing, an x-ray tube having an anode and a cathode filament disposed in said housing for projecting x-radiation therefrom, a stepup transformer in said housing having a primary winding and at least a pair of secondary windings and a loop circuit connecting said

secondary windings in series, rectifier means in said housing, having input means coupled with said secondary windings and d-c output terminals to which said anode and cathode of said tube are connected, respectively, and a low voltage filament transformer in said housing having its secondary winding connected for energizing said filament and having a primary winding, a filament control and safety shutdown system including:

(a) an output transformer having a secondary winding connected to said primary winding of said filament transformer and a primary winding connected to a source of voltage in the range of one to four kHz,

(b) a microprocessor control and means controlled by said control to energize said cathode filament and said anode in sequence in response to an operator initiated signal, said



x-tube being operative to produce x-radiation when said anode is energized,

(c) a time delay circuit connected to said control and operative to start measurement of a predetermined time interval when said anode is energized,

(d) a voltage comparator circuit having input means for a voltage proportional to the current flowing through said x-ray tube when its anode is energized, said time delay circuit enabling said voltage comparator circuit to sense the value of said proportional current after said interval is initiated, said comparator being operative to provide a signal to said control for enabling said control to maintain energization of said anode and said cathode filament only if the value of the current flowing between said anode said cathode filament during said time interval is sufficient to provide useful radiographs.

4,188,537

DENTAL APPARATUS FOR X-RAY DIAGNOSIS

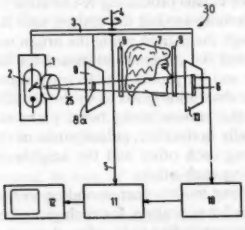
Kurt Franke, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 19, 1977, Ser. No. 834,314

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1976, 2646638

Int. Cl.[2] G03B *41/16*

U.S. Cl. 250—416 TV **3 Claims**



1. In a dental apparatus for x-ray diagnosis including a head support for supporting a head of a patient in a given position, and a unit having an x-ray tube and carrier for a radiation receiver, said unit being rotatable about a vertical axis with the x-ray tube and carrier rotating about the head support, said apparatus including an operative sequence mechanism for fixing the exposure time in advance as the apparatus prepares a dental survey image, the improvement comprising the radiation receiver including transducer means for measuring radiation intensities and forming electrical signals corresponding to the measured radiation intensities, said transducer means being connected to a data processing installation having means for storing electrical signals for one exposure sequence and means for creating a dental survey image from the stored electrical signals, said transducer means consisting of a plurality of detectors arranged on a vertical extending line with the number of detectors being selected to correspond to the desired image resolution, said unit further including a diaphragm with a vertically extending slit-shaped aperture disposed on the unit between the x-ray tube and the support for the head so that a beam of radiation passing through the patient has a strip shape and impinges on all detectors of the transducer means, and the apparatus including an image reproduction device connected to the data processing installation for displaying the created dental survey image.

4,188,538

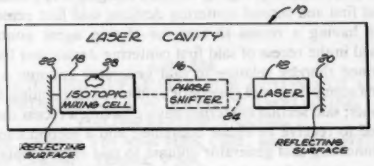
EFFICIENT PARTICLE EXCITATION

Jean-Claude Diels, Pacific Palisades, Calif., assignor to University of Southern California, Los Angeles, Calif.

Filed Mar. 30, 1977, Ser. No. 782,869

Int. Cl.[2] H01J *27/00*

U.S. Cl. 250—423 P **17 Claims**



1. In a method of separating a particle species from a mixture with other particles through irradiation of said mixture with light, isolating said particle species at a predetermined location spatially distinct from that of said other particles, and collecting said other particles species from said predetermined location, said other particles being capable of substantially absorbing light at a wavelength corresponding to single or multiphoton absorption, said particle species being capable of substantially absorbing light at a wavelength close to, but not equal to, said wavelength and absorbing light differently at said wavelength, the improvement comprising disposing said mixture in a cavity of a mode-locked laser and irradiating said mixture with a plurality of repetitious coherent light pulses of said wavelength, applied to said mixture at said wavelength, each of a duration of less than 10 nanoseconds with a frequency spectrum sufficiently broad to contain energy at the light absorption wavelength of said particle species, the path of said light pulses traversing and reflecting back through said cavity whereby as said mixture is irradiated by said light pulses said particle species initially absorbs then restitutes light of said wavelength during said reflection to impart momentum characteristics to said particle species distinguishing it from the momentum characteristic of said other particles.

4,188,539

NUCLIDE GENERATOR FOR PREPARING RADIO-NUCLIDES

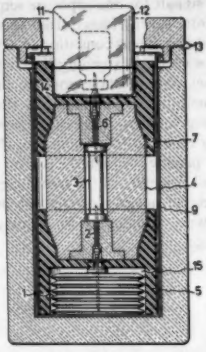
Heimut Strecker, Seeheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Mar. 21, 1978, Ser. No. 888,756

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1977, 2712635

Int. Cl.[2] **H01J** *27/00*

U.S. Cl. 250—432 PD **6 Claims**



1. A nuclide generator for preparing a sterile and pyrogen-free radioactive solution, comprising a vessel; a radiation shield disposed in said vessel; a generator column positioned within said radiation shield; a first centering device positioned at one end of said vessel; a second centering device positioned at the other, opposite end of said vessel remote from said first centering device, said generator column being located between said first and second centering devices and being fixedly positioned by said first and second centering devices; said first centering device having a recess therein; an eluting agent container disposed in the recess of said first centering device and fixedly positioned thereby relative to said generator column; a first cannula connecting said generator column to said eluting agent container; said second centering device having a recess therein adapted to receive an eluate container; and a second cannula for connecting said generator column to said eluate container; said generator column and said first and second cannulae extending generally in the axial direction of said vessel.

4,188,540

X-RAY APPARATUS COMPRISING A WEIGHT COMPENSATION DEVICE

Friedrich Reiniger, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 21, 1978, Ser. No. 944,289

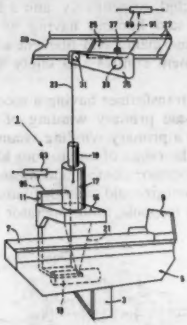
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1977, 2742642

Int. Cl.[2] **G01N** *21/00, 23/00;* **G21K** *5/06, 5/08*

U.S. Cl. 250—439 R **5 Claims**

1. In X-ray apparatus of the type which includes a carriage which is suspended from and displaceable along a ceiling; motor means which function to displace said carriage along said ceiling; a flexible connecting member having a first end attached to said carriage; and a displaceable component suspended from a second end of said flexible member, the improvement comprising:

transducer means which generate an output signal which represents a relative horizontal displacement between the carriage and the displaceable component and control circuit means which receive the output signal from the transducer and operate the motor means to decrease said relative displacement whenever said relative displacement exceeds a reference value.



4,188,541

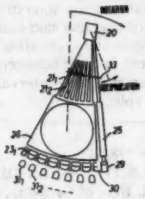
APPARATUS FOR EXAMINING A BODY BY RADIATION SUCH AS X OR GAMMA RADIATION

Godfrey N. Hounsfield, Newark, England, assignor to EMI Limited, Hayes, England

Division of Ser. No. 780,971, Mar. 24, 1977, abandoned, which is a continuation of Ser. No. 657,543, Feb. 12, 1976, Pat. No. 4,052,618, which is a division of Ser. No. 468,005, May 7, 1974, Pat. No. 3,944,833, which is a division of Ser. No. 349,198, Apr. 9, 1973, Pat. No. 3,866,047, which is a continuation-in-part of Ser. No. 212,778, Dec. 21, 1971, Pat. No. 3,778,614, which is a continuation of Ser. No. 861,358, Aug. 21, 1969, abandoned. This application Dec. 8, 1977, Ser. No. 858,612

Int. Cl.[2] **G03B** *41/16*

U.S. Cl. 250—445 T **13 Claims**



1. A medical diagnostic X-ray machine for examining a patient and for building up and displaying a two-dimensional picture of the X-ray absorption coefficients of the elements into which a substantially planar slice of the patient is divided by a finite Cartesian notional matrix superimposed on the slice, said machine comprising:

X-ray source means producing X-radiation originating at an origin scanning around the patient, said X-radiation passing through the patient while the origin scans at least half way around the patient, and means for detecting the X-radiation and for producing electrical signals corresponding to the absorption suffered by the X-radiation in passing through the patient along beam paths which are in or substantially in the slice, at least some of these beam paths intersecting each other and the neighboring beam paths overlapping each other;

signal receiving meshes corresponding to the slice elements and means for allocating, for each given beam path, to the meshes corresponding to the slice elements through which the given beam path passes, allocations determined by a correction signal weighted in accordance with the relative disposition of the given beam path and the slice elements

through which the given beam path passes, said correction signal being determined by modifying the electrical signal corresponding to the given beam path in accordance with other electrical signals, corresponding to beam paths which pass through slice elements other than those through which the given beam path passes, and for accumulating said allocations to each signal receiving mesh to thereby build up said picture; and

means for displaying the so accumulated allocations to the signal receiving meshes to thereby display said two-dimensional picture of the X-ray absorption coefficients of the elements of the patient slice examined by the X-ray machine.

4,188,542

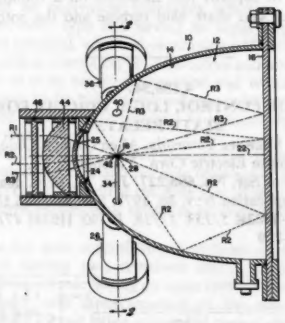
MIRROR IMAGE ELLIPSOID RADIATION COLLECTOR AND METHOD

Walter R. Hogg, South Miami, and Albert Brunsting, Miramar, both of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Continuation-in-part of Ser. No. 888,566, Mar. 20, 1978, abandoned. This application Apr. 24, 1978, Ser. No. 899,583

Int. Cl.[2] **G01J** *1/58;* **G01N** *21/38, 33/16*

U.S. Cl. 250—458 **24 Claims**



1. A radiation collector apparatus for analyzing particulate material wherein irradiation of the particulate material produces a source of detectable radiation, comprising:

a reflector chamber having a first reflector surface and a second reflector surface,

said first reflector surface substantially having a configuration of a half portion of an ellipsoid of revolution generated by rotating about a major axis of an ellipse a portion of the ellipse extending to and terminating at a minor axis of the ellipse,

said first reflector surface having a primary focus and a secondary focus with said primary focus being positioned within said reflector chamber at the source of detectable radiation,

said second reflector surface having a substantially planar configuration,

said second reflector surface being positioned so that any position thereon is substantially disposed in equally spaced relationship to said primary focus and said secondary focus,

a window formed in one of said reflector surfaces and aligned in intersecting relationship with a symmetry axis defined by said primary focus and said secondary focus,

wherein the detectable radiation emanating from the primary focus proceeds either directly or after one or more reflections through said window.

4,188,543

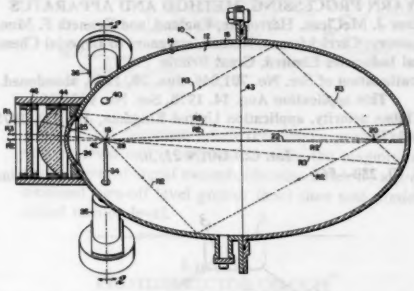
ELLIPSOID RADIATION COLLECTOR APPARATUS AND METHOD

Albert Brunsting, Miramar, and Walter R. Hogg, South Miami, Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Continuation-in-part of Ser. No. 888,567, Mar. 20, 1978, abandoned. This application Apr. 24, 1978, Ser. No. 899,584

Int. Cl.[2] **G01J** *1/58;* **G01N** *21/38, 33/16, 21/00*

U.S. Cl. 250—458 **21 Claims**



1. A radiation collector apparatus for analyzing individually isolated particles wherein irradiation of the particles produces a source of detectable radiation, comprising:

a reflector chamber having a substantially ellipsoidal reflector surface with a pair of foci defining a symmetry axis,

a window formed in said reflector chamber and aligned in intersecting relationship with said symmetry axis,

said window being dimensioned and configured to provide for a portion of the detectable radiation to reflect within said reflector chamber more than once,

whereby almost all of the detectable radiation emanating from one of said foci proceeds either directly or after one or more reflections through said window in an organized beam to be analyzed.

4,188,544

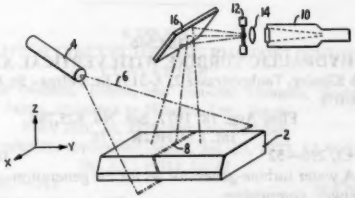
METHOD AND APPARATUS FOR AUTOMATICALLY PROCESSING A WORKPIECE EMPLOYING CALIBRATED SCANNING

Leon H. Chasson, Los Altos Hills, Calif., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Aug. 22, 1977, Ser. No. 826,554

Int. Cl.[2] **G01B** *11/00;* **G01N** *21/30*

U.S. Cl. 250—560 **26 Claims**



18. A system for scanning a three-dimensional workpiece comprising

means having a field of view for scanning said workpiece in said field of view to generate signals related to the three-dimensional spatial coordinates of said workpiece, and

means for modifying said signals to calibrate said scanning means,

said means for modifying including memory means storing calibration information derived by comparing scanning signals of a known three-dimensional reference piece with

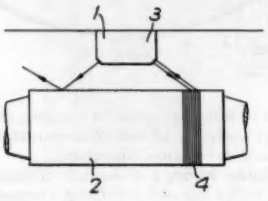
previously stored three-dimensional spatial coordinates of said known reference piece.

4,188,545

YARN PROCESSING, METHOD AND APPARATUS

Arthur J. McClean, Harrogate, England, and Kenneth F. Montgomery, Carrickfergus, Ireland, assignors to Imperial Chemical Industries Limited, Great Britain

Continuation of Ser. No. 701,046, Jun. 29, 1976, abandoned.
This application Aug. 14, 1978, Ser. No. 933,206
Claims priority, application United Kingdom, Jun. 30, 1975, 27544/75
Int. Cl.[2] G01N *21/30*
U.S. Cl. 250—561 **8 Claims**



1. A method for detecting the presence of yarn wraps on the peripheral surface of a rotating roll and consequently severing the yarn being wrapped at a point upstream of the roll wherein the improvement comprises continuously directing light from a source thereof towards the moving peripheral surface of the roll, continuously monitoring by photosensitive means, reflecting light from said moving surface, detecting any change in the intensity of light which returns from the roll in the absence of a yarn wrap and that arising from the presence of such a wrap, said light being directed such that substantially no light is received by the detecting means in the absence of a yarn wrap, and converting such change into an electrical signal to activate yarn severing means to severe said yarn at a point prior to reaching said roll.

4,188,546

HYDRAULIC TURBINE WITH VERTICAL AXIS

Erich Kössler, Tauberstrasse 2, A-3151 St. Pölten - St. Georgen, Austria

Filed Aug. 18, 1977, Ser. No. 825,780
Int. Cl.[2] H02K *7/18*
U.S. Cl. 290—52 **16 Claims**

1. A water turbine-generator set for the generation of electrical power, comprising:

a vertical rigid shaft;

a water turbine disposed at the lower end of said shaft and having a turbine rotor connected thereto;

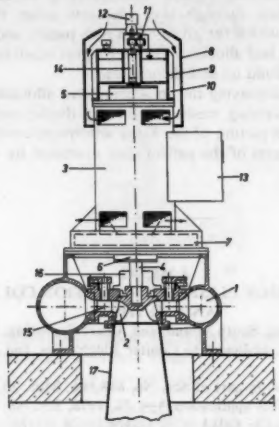
a flywheel connected directly to said shaft above said rotor;

an electric current generator surrounding said shaft and connected thereto above said flywheel, said generator having a generator rotor;

an oil pump connected directly to said shaft for supplying oil under pressure to regulate the output of said set; and

a speed control for said turbine connected directly to said shaft, said oil pump being disposed on said shaft above said generator,

an intake scroll surrounding said water turbine; and



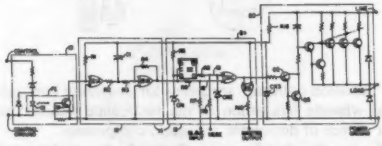
a plurality of support feet mounted on a foundation and supporting said shaft, said turbine and the rotor of said generator.

4,188,547

MULTI-MODE CONTROL LOGIC CIRCUIT FOR SOLID STATE RELAYS

David A. Fox, Shawnee Township, Allen County, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 698,227, Jun. 21, 1976, abandoned.
This application Nov. 30, 1977, Ser. No. 856,155
Int. Cl.[2] H03K *5/153, 17/18, 17/60;* H01H *47/18*
U.S. Cl. 307—239 **8 Claims**



1. A control logic circuit capable of controlling the operation of a solid state relay in any one of a plurality of modes of operation, said circuit comprising:

threshold sensing means for responding to an input voltage signal of a given polarity and at least a given magnitude by producing a logic signal of a relatively fixed, predetermined magnitude that follows the input in polarity;

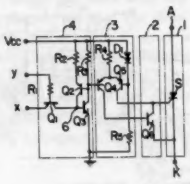
a logic gate having a first input terminal operatively connected to receive said logic signal from said threshold sensing means and a second input terminal, said second input terminal having a fixed interconnection to means for generating a first signal changing in logic state only upon a predetermined change in the waveform of said logic signal from said threshold sensing means, means for selectively overriding said first signal comprising a line connected to said second input terminal with an externally available MODE terminal on said line, said logic gate also having an output terminal providing an output signal for operation of a solid state relay;

said MODE terminal requiring no connection for an output signal from said logic gate to provide latching type operation of the relay.

4,188,548
SEMICONDUCTOR SWITCHING CIRCUIT

Ichiro Ohninata, Yokohama, Japan, assignor to Hitachi, Ltd., Japan

Filed Oct. 26, 1977, Ser. No. 845,722
Claims priority, application Japan, Oct. 29, 1976, 51-129529
Int. Cl.[2] H03K 17/72
U.S. Cl. 307—252 C 11 Claims



1. A semiconductor switching circuit comprising:

a gate-turnoff thyristor having an anode terminal, a cathode terminal and a gate terminal, the anode-cathode path of which is turned on or off in accordance with the direction of the current flowing through said gate terminal;

a holding circuit including therein a semiconductor element having an equivalent four-layer structure of a PNPN conductivity type and having an input terminal and an output terminal, which element has a self-holding function for holding alternately its conductive and non-conductive states to store binary information and which determines the state to be held in accordance with an input signal applied to said input terminal to indicate the state to be held; and

a gate control circuit coupled between the output terminal of the holding circuit and the gate terminal of the gate-turn-off thyristor to control the direction of the current flowing through the gate terminal of said gate-turnoff thyristor,

wherein the gate control circuit includes a gate switching circuit having two terminals and a constant current switching circuit having an input terminal and two output terminals, said input terminal of the constant current switching circuit being connected to said output terminal of said holding circuit, one of said output terminals of the constant current switching circuit being connected to said gate terminal of said gate-turnoff thyristor, the other one of said output terminals of said constant current switching circuit being connected to one of said two terminals of said gate switching circuit, the other one of said two terminals of said gate switching circuit being connected to said gate terminal of said gate-turnoff thyristor, thereby turning on or off said gate-turnoff thyristor in accordance with the state of the holding circuit.

4,188,549
ACOUSTICALLY RESPONSIVE SENSOR SWITCH

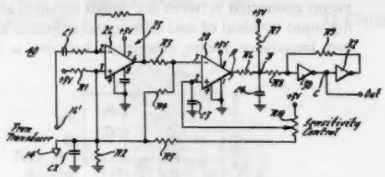
Mark V. Dorais, Detroit, Mich., assignor to Federal Screw Works, Detroit, Mich.

Filed Nov. 11, 1977, Ser. No. 850,666
Int. Cl.[2] H03K 3/26
U.S. Cl. 307—308 4 Claims

1. An acoustically responsive sensor switch comprising:

transducer means for detecting a localized acoustic sound and producing an electrical audio signal in response thereto; and

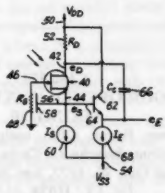
circuit means connected to said transducer means for producing a switching signal in response to said audio signal including magnitude comparator means for comparing the magnitude of said audio signal with the magnitude of a threshold signal and producing a square-wave output signal, integrator means having a response time greater than the duration of a single pulse of said square-wave signal connected to said comparator means for integrating said square-wave signal, and trigger circuit means connected to said integrator means for producing an output signal that is initiated when the magnitude of said integrated signal decreases below (exceeds) a predetermined turn-on level and is terminated when the magnitude of said integrated signal exceeds (decreases below) a predetermined turn-off level greater (less) than said predetermined turn-on level.



4,188,550
PHOTODETECTOR CIRCUIT

Jackson Lum, Fresh Meadows, N.Y., assignor to Medfare, Inc., Westbury, N.Y.

Filed Nov. 1, 1977, Ser. No. 847,591
Int. Cl.[2] H03K 17/00
U.S. Cl. 307—311 9 Claims



1. A photodetector circuit comprising,

photodetector means having first and second main electrodes and a photoresponsive control electrode, and

circuit means intercoupling said main and control electrodes for effecting a bootstrap action between said control and main electrodes and for substantially equalizing the AC voltages at said main and control electrodes to reduce the effective value of the stray capacitances between the electrodes.

4,188,551
AMPLIFIER CIRCUIT HAVING PHOTOELECTRIC CONVERTER

Takashiroh Iwasaki, Tokyo, and Jun-ichi Mameda, Kodaira, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 29, 1978, Ser. No. 920,248
Claims priority, application Japan, Jul. 29, 1977, 52/90327
Int. Cl.[2] H01J 39/12
U.S. Cl. 307—311 10 Claims

1. A photometric amplifier circuit for amplifying an electric signal in response to a quantity of light, comprising:

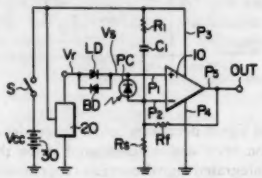
a differential amplifier having inverting and noninverting input terminals, and an output terminal;

a photoelectric converting element for converting the quantity of light to an electric signal, said element being connected between the inverting and noninverting input terminals of said differential amplifier;

closed circuit means provided to form a closed circuit across said photoelectric converting element, to permit the flow of the converted electric signal of said converting element;

a power supply for energizing said differential amplifier, wherein the power voltage is supplied via a power switch to said differential amplifier;

a negative feedback circuit including a first impedance means connected between the output terminal and inverting input terminal of said differential amplifier and a second impedance means connected between a reference



potential source and the inverting input terminal of said differential amplifier; and

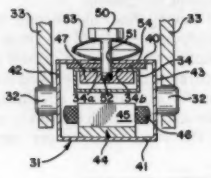
voltage supplying means, connected to the inverting input terminal of said differential amplifier, for supplying a voltage to the inverting input terminal of said differential amplifier transiently when said power switch is closed to prevent the build-up of accumulated charge in the photoelectric converting element.

4,188,552

GARAGE DOOR OPENER INCLUDING A LINEAR ACTUATOR

Claude M. Brimer, Bryan, Ohio, assignor to Linear International Corporation, Rancho La Costa, Calif.

Filed Oct. 26, 1977, Ser. No. 845,625
Int. Cl.[2] H02K *41/02*
U.S. Cl. 310—13 **8 Claims**



1. A door operator of the type utilizing a conventional single-phase power supply for driving a garage door or other large door between open and closed positions in a building or other structure comprising:

a stationary motor mounting;

a linear induction motor pivotally secured on said mounting, said motor including

a rigid frame;

a stator mounted in insulated manner on said frame and including a pair of conductive windings mounted thereon;

a flux return member mounted on said frame in spatial relation to said stator and defining a gap therebetween;

at least a portion of an electric circuit connected with said pair of windings which when energized produces a magnetic flux across said gap; and

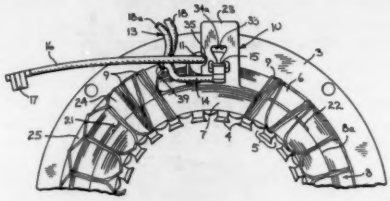
an elongate armature disposed in said gap for moving traversely therethrough in response to said magnetic flux, and said armature including pivotal mounting means adjacent at least one end thereof adapted for connection to a door member.

4,188,553

POCKET RECEPTACLE FOR SECURING A SENSING ELEMENT WITHIN ELECTRICAL WINDINGS

William H. Wheaton, Sharpsburg, Ky., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed Feb. 8, 1978, Ser. No. 875,995
Int. Cl.[2] H02K *11/00*
U.S. Cl. 310—68 C **3 Claims**



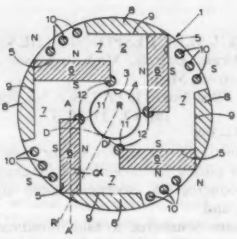
1. An electrical insulating pocket receptacle for receiving and securing a sensing element within an electrical winding of a dynamoelectric rotary machine, said receptacle having a body support portion provided from a sheet of flat flexible material, a pocket formed from a second sheet, means fixedly securing said pocket to the body portion of the sheet, said pocket providing an internal cavity open at one end to receive the sensing element and of a configuration conforming in general to that of the sensing element to securely hold the sensing element within the pocket, said support portion including a pair of support tabs extending in opposite directions from said pocket, a wire holding tab offset from the pocket and connected to one of said pair of tabs and adapted to be folded about itself in overlying relationship to said tab to form a multiple layer channel to accept leads of said windings, said folded wire holding tab being adapted to be secured abutting the exterior of the windings, and an insulating separate tab having a width greater than the width of the pocket back wall portion, and means to interconnect the tab to the back wall portion with said tab extended beyond the bottom of the pocket and support portion and adapted to be folded over the pocket to additionally insulate the front and back of the sensing element received in the pocket from the winding.

4,188,554

ALTERNATING CURRENT ROTATING ELECTRIC MACHINE

Kenneth J. Binns, Chandler's Ford, England, assignor to The University of Southampton, Southampton, England

Filed Dec. 13, 1977, Ser. No. 860,072
Int. Cl.[2] H02K *21/08*
U.S. Cl. 310—156 **11 Claims**



1. An alternating current rotating electric machine having a permanent magnet rotor comprising a generally cylindrical body of magnetic material having a plurality of regularly spaced, inwardly extending open ended slots formed around its

circumference so as to define pole-pieces there between with adjacent pole-pieces connected by magnetic material of the body at the base of the slot between said adjacent pole-pieces; a plurality of permanent magnets which are located in said open ended slots so as to induce poles of alternate polarity in the pole-pieces, the central axes of the slots being uniformly inclined relative to respective radii of the body which pass through the centers of the outer open ends of the slots, and the magnetic axes of the magnets extending transversely of the respective central axes of the slots with the pole-faces of the magnets abutting opposite sides of the slots; and a peripheral portion of each pole-piece being formed with a notch that extends circumferentially from that side of the open end of a slot facing an adjacent slot towards said adjacent slot so as to restrict the cross-sectional area of the pole-piece and localize the corresponding pole to a region opposite the outwardly directed pole-face of a magnet in said adjacent slot.

4,188,555

STATOR OF UNI-DIRECTIONAL SELF STARTING SYNCHRONOUS MOTOR

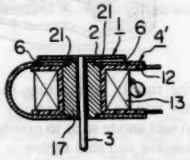
Yasuo Suzuki, and Tosihisa Hirai, both of Shijonawate, Japan, assignors to Matsushita Electric Works, Ltd., Japan

Filed Jan. 24, 1977, Ser. No. 761,796

Claims priority, application Japan, Jan. 30, 1976, 51/11297[U]

Int. Cl.[2] H02K *19/00*

U.S. Cl. 310—162 **4 Claims**



1. A unidirectional self-starting synchronous motor comprising, in combination, an annular coil having flat end surfaces, a cylindrical bearing of magnetic material containing a hole, said cylinder bearing being fitted into the coil extending between the end surfaces, a unitary yoke including a single continuous strip of magnetic material having a "U" shaped cross-section with the free ends thereof defining opposed flat parts being spaced to lie flatly adjacent the respective end surfaces of the coil, said yoke including an annular part containing a hole, a plurality of inner pole teeth extending radially outwardly from said annular part, and a plurality of outer pole teeth extending inwardly toward said annular part, each said inner pole tooth being substantially wider in the circumferential direction than each said outer pole tooth, said outer pole teeth being positioned to be between said inner pole teeth, respectively, said annular part and said inner pole teeth being separated from the remaining portion of said yoke except for a plurality of connecting parts for connecting said annular part to some of said teeth and the remaining portion of said yoke, said connecting parts being less in number than the number of said outer pole teeth, said teeth forming poles of alternate polarity when the coil is energized, a rotor in the form of a disc-shaped body having a number of magnetizations thereon cooperating with the poles of alternate polarity and having a shaft extending perpendicularly to the disc-shaped body, the shaft extending through the hole in said annular part and being rotatably journaled in the hole of the cylindrical bearing, said outer pole teeth being positionally deviated, from an equally spaced position relative to said inner pole teeth, toward said inner pole teeth in the desired direction of rotation of said rotor, said yoke including said annular part and said inner and outer pole teeth forming one integral stator.

4,188,556

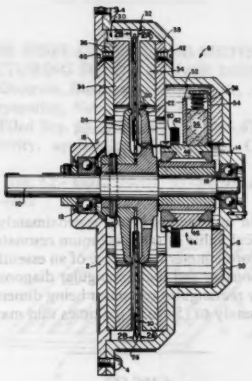
ELECTRO-MECHANICAL MACHINE

James H. Hahn, Ft. Lauderdale, Fla., assignor to ACR Electronics, Inc., Hollywood, Fla.

Filed Jul. 18, 1977, Ser. No. 816,610

Int. Cl.[2] H12K *23/04*

U.S. Cl. 310—268 **11 Claims**



1. An electro-mechanical machine comprising:

first and second flat spaced parallel stator members, each having a circular array of 2N magnetic poles of alternately opposite polarity, where N is a number of pairs of such poles, each pole of one stator member being opposite and spaced from an opposite-polarity pole of the other stator member,

a disc armature rotor between said stator members having an array of coils on each face thereof, and

a commutator rotatable together with said rotor and having 4N segments, with N sequential sets of four sequential segments each, the N corresponding (i.e., first, second, third, or fourth) segments of each set being interconnected,

the coil array on one rotor face being angularly displaced relative to the coil array of the other rotor face by one half of the angular pitch between two adjacent coils, the coils on one half of one face of said rotor being connected together and to one pair of segments of said commutator segment sets, the coils on the other half of said one face of said rotor being connected together and to the remaining pair of segments of said segment sets, the coils on one half of the other face of said rotor being connected together and to a segment of said one pair and a segment of said remaining pair, and the coils on the other half of said other rotor face being connected together and to the other segment of said one pair and the other segment of said remaining pair.

4,188,557

PIEZOELECTRIC OVERTONE RESONATOR WITH AT LEAST A CONVEX SURFACE AND SPECIFIC THICKNESS AND DIAMETER OR DIAGONAL

Werner Mattuschka, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 20, 1978, Ser. No. 962,384

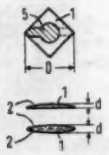
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1977, 2752734

Int. Cl.[2] H01L *41/10*

U.S. Cl. 310—368 **6 Claims**

1. A thickness shear crystal overtone resonator for use in a quartz stabilized oscillator in the MHz range and wherein the resonator is used in cooperation with an essentially aperiodic

oscillator circuit without additional frequency selection means through specified dimension ratios of the resonator, comprising: a thin plate-like crystal having a convex surface and an opposed plane surface; the resonator having a maximum resonator thickness in millimeters of approximately (n·1700)/f where f is an operating frequency in kHz and n is an ordinal number of a desired harmonic; a radius of the convex surface of



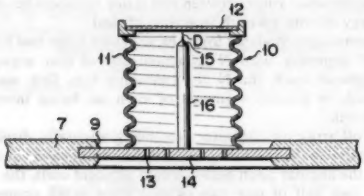
the resonator in millimeters being approximately 140 to 180 times a reciprocal value of said maximum resonator thickness; and the resonator diameter in the case of an essentially circular disk-shaped resonator and the rectangular diagonal in the case of an essentially rectangular resonator being dimensioned to be equal approximately to (54 to 72)/n times said maximum resonator thickness.

4,188,558

X-RAY TUBE

Toshio Yamamura, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Jun. 6, 1978, Ser. No. 913,208
Claims priority, application Japan, Jun. 11, 1977, 52-69275
Int. Cl.[2] H01J *35/16*
U.S. Cl. 313—55 **15 Claims**



1. An X-ray tube comprising an evacuated envelope having an anode and cathode sealed therein, said envelope having an opening therein at a predetermined position in a wall portion of said envelope, a vertically movable flexible member extending from said wall portion at said opening and sealed to said wall portion, a rod having a sharp edge, said rod being supported at said wall portion and serving to pierce through said flexible member when the difference between the internal and external pressure of said envelope becomes greater than a predetermined value, and wherein the sharp edge of said rod is spaced from said flexible member by a predetermined distance.

4,188,559

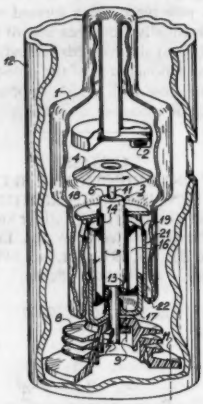
ROTARY ANODE X-RAY TUBE

Charles Carville, and André Laffitte, both of Paris, France, assignors to Compagnie Generale de Radiologie, Paris, France

Filed Jul. 28, 1978, Ser. No. 928,216
Claims priority, application France, Jul. 29, 1977, 77 23444
Int. Cl.[2] H01J *35/10, 35/16*
U.S. Cl. 313—60 **1 Claim**

1. In an X-ray tube disposed within a grounded metal casing including a sealed enclosure having a glass portion in which are positioned a fixed cathode, a motor having a rotor and a stator disposed outside of the enclosure and a rotary anode secured to the rotor, a fixed shaft extending outside of and tightly connected to the enclosure with the rotor rotatably mounted on the fixed shaft, the rotor and stator being at the same DC potential as the anode and separated by a separating wall of non-magnetic metal forming part of the sealed enclosure, the improvement which comprises,

a U-shaped glass fold having two branches in said sealed enclosure glass portion, said U-shaped fold arranged to extend around the assembly comprising said rotor, said stator and said separating wall whereby said two branches are interposed between said assembly and said metal casing,



a metal plate for tightly connecting the free end of said U-shaped glass fold to the extremity of said separating wall closest to said anode so as to provide a thermal screen between said anode and said motor,

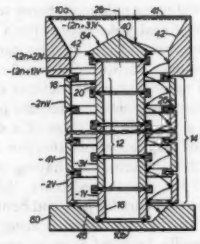
said U-shaped glass fold interposed between said motor and said metal casing permitting the application of a high DC voltage, necessary for operating the tube, between said anode and said cathode symmetrically with respect to ground whereby said tube can be operated at very high voltages.

4,188,560

FLANGED CYLINDRICAL ELECTRON MULTIPLIERS

Donald L. Swingler, Park Orchards, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Aug. 25, 1978, Ser. No. 936,911
Claims priority, application Australia, Aug. 24, 1977, 1373/77
Int. Cl.[2] H01J *43/10*
U.S. Cl. 313—105 R **24 Claims**



1. An electron multiplier of the kind in which, in use of the multiplier, a charge current is amplified by passage to, and by secondary emission of electrons from, surfaces of successive

dynodes of a dynode array, there being two generally parallel rows of said dynodes, the dynodes in each row being in side-by-side position, said successive dynodes being dynodes in alternate ones of said rows and succeeding adjacent ones of the dynodes in each row receiving said charge current in use of the multiplier; said dynodes being shaped such that electric potentials which are in use applied to the dynodes generate an electric field between the two rows such as to effect substantial direction of secondary electrons produced at said surface to the surface of the next successive dynode, wherein the surfaces of dynodes in one said row are substantially cylindrical in configuration on a common axis, dynodes of the one row being spaced along said axis, the surfaces of dynodes of the other said row also being substantially cylindrical in form and coaxial with surfaces of dynodes of the first row, the said surfaces of the dynodes of the other said row being of greater diameter than those of dynodes of the first row and dynodes of the said other row being spaced lengthwise along the said axis, the surfaces of dynodes of said one row facing away from said axis and the surfaces of dynodes of the other row facing towards said axis in opposed relationship to the surfaces of dynodes of said one row; said surface of each dynode being linear and parallel to said axis when viewed in axial section, with first and second flanges positioned along edges of the surface at opposite axial ends thereof, said first flange extending substantially normally to the surface from one said opposite edge and said second flange having a first portion extending substantially normally to the surface from the other opposed edge in the same direction as said one flange and a second portion extending from an outer longitudinal edge of the first portion parallel to said surface and directed in the direction away from the first flange.

4,188,561

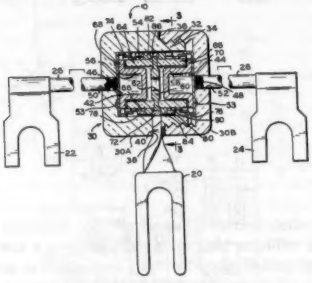
STATION PROTECTOR SPARK GAP APPLIQUE

Walter T. Pranke, and Manfred W. Wilms, both of Goleta, Calif., assignors to Joslyn Mfg. and Supply Co., Chicago, Ill.

Continuation of Ser. No. 759,533, Jan. 14, 1977, abandoned. This application Oct. 10, 1978, Ser. No. 950,160

Int. Cl.[2] **H01J** *17/00, 21/00*

U.S. Cl. 313—325 **39 Claims**



1. A spark gap protector applique adapted for connecting to a station protector and including lead wires for connection to said station protector, said applique comprising:

a gas tube spark gap device including end terminals,

an insulated enclosure for receiving said gas tube spark gap device, said enclosure being provided with connection means which are substantially unitary with said lead wires for making connection with said end terminals of said spark gap device,

and a fail safe shorting means located within said enclosure and activated by heat for bringing about shorting of said spark gap device under predetermined discharge conditions,

said fail safe shorting means including fusible metal means in heat exchanging relation with said spark gap device and a bias spring and a perforated insulated member located between said spring and said fusible metal means, wherein said spring causes flow of fusible metal through perforations of said insulated member to complete shorting of said spark gap device via said spring when said fusible metal means is fused.

4,188,562

COLOR DISPLAY TUBE AND METHOD OF MANUFACTURING SUCH A COLOR DISPLAY TUBE

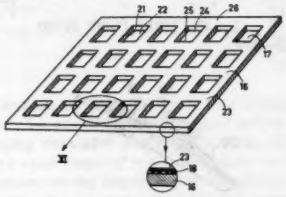
Karel J. Van Oostrum, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 28, 1978, Ser. No. 946,670

Claims priority, application Netherlands, Oct. 27, 1977, 7711772

Int. Cl.[2] **H01J** *29/07, 31/20, 9/14*

U.S. Cl. 313—402 **4 Claims**



1. A colour display tube comprising in an evacuated envelope means for generating a plurality of electron beams, a display screen comprising a large number of regions luminescing in different colours, and colour selection means comprising a metal plate having a large number of apertures therein which assign each electron beam to luminescent regions of one colour, an insulating film covering one side of said metal plate and a metal film provided on said insulating film, said insulating film and metal film extending on two opposite portions of the wall of each aperture, said plate and said metal film defining a pair of electrodes for producing an electron lens in said apertures.

4,188,563

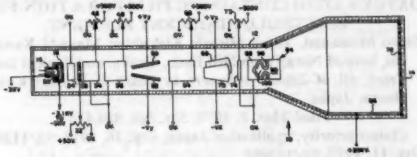
CATHODE RAY TUBE HAVING AN ELECTRON LENS SYSTEM INCLUDING A MESHLESS SCAN EXPANSION POST DEFLECTION ACCELERATION LENS

Bozidar Janko, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Division of Ser. No. 757,425, Jan. 6, 1977, Pat. No. 4,137,479, Jan. 30, 1979. This application Aug. 31, 1978, Ser. No. 938,607

Int. Cl.[2] **H01J** *29/56, 29/62*

U.S. Cl. 313—460 **9 Claims**



8. An accelerating quadrupole lens for use in a cathode ray tube, comprising:

tubular members disposed adjacent each other and being positioned along a common axis;

bilobular section means provided by one of said tubular members defining opposing bilobular sections, each of said opposing bilobular sections including a necked-down section having lobes extending outwardly and slightly

upwardly from said necked-down section with said lobes having the same radius; and

means connecting said tubular members together to maintain said tubular members in position relative to each other to provide said quadrupole accelerating lens.

4,188,564

CATHODE RAY TUBE HAVING LOW RESISTANCE CONTACT AREA BENEATH HIGH VOLTAGE CONTACT SPRING

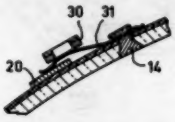
Antonius P. F. Zegers, and Johannes M. A. A. Compen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 764,347, Jan. 31, 1977, abandoned. This application May 26, 1978, Ser. No. 910,081

Claims priority, application Netherlands, Dec. 13, 1976, 7613806

Int. Cl.[2] H01J *29/07, 29/00*

U.S. Cl. 313—479 **5 Claims**



1. A color television display tube comprising an evacuated envelope, an electrode system disposed in said envelope for generating at least two electron beams, a display screen on an internal wall portion of said envelope, an electrically resistive layer for restricting currents produced during electric flashovers provided on a portion of the internal wall of said envelope disposed between said electrode system and said display screen, a color selection means positioned in said envelope a predetermined distance from said screen, at least one metal contact spring disposed opposite said resistive layer, means for electrically connecting said spring to said color selections means, a contact face having an electrical conductivity at least ten times greater than the conductivity of said resistive layer and an area of at least 5 cm^2 applied on said resistive layer between said layer and said spring for reducing the contact resistance therebetween to thereby reduce electromagnetic interference radiation generated by the display tube and means arranged in said envelope for maintaining said spring in engagement with said contact face to thereby electrically connect said color selection means of said resistive layer.

4,188,565

OXYGEN ATOM CONTAINING FILM FOR A THIN-FILM ELECTROLUMINESCENT ELEMENT

Etsuo Mizukami, Tenri; Hiroshi Kishishita; Masashi Kawaguchi, both of Nara; Yoshihiro Endo, Osaka, and Kinichi Isaka, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 8, 1978, Ser. No. 884,475

Claims priority, application Japan, Sep. 16, 1977, 52/112018; Oct. 11, 1977, 52/122084

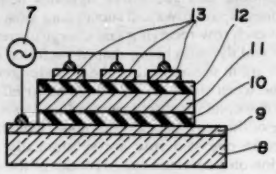
Int. Cl.[2] H05B *33/02, 33/22*

U.S. Cl. 313—509 **14 Claims**

1. A thin-film electroluminescent element comprising:

a thin-film electroluminescent layer including a luminescent center;

first and second dielectric layers, said electroluminescent layer being disposed between said dielectric layers, at least one of said dielectric layers containing oxygen in the atomic state which provides a bonding force between the dielectric layer and the thin-film electroluminescent layer; and



first and second electrodes provided on said dielectric layers, respectively.

4,188,566

METHOD FOR DETECTING COORDINATES OF GAS DISCHARGE PANELS AND APPARATUS FOR CARRYING OUT THE SAME

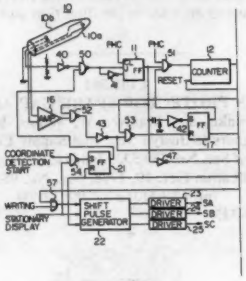
Hirohide Miwa, and Toshiaki Terakawa, both of Kawasaki, Japan, assignors to Fujitsu Limited, Japan

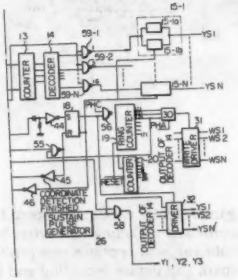
Filed Dec. 20, 1977, Ser. No. 862,499

Claims priority, application Japan, Dec. 22, 1976, 51-154702

Int. Cl.[2] H05B *37/00, 39/00, 41/00*

U.S. Cl. 315—169.4 **12 Claims**





1. A method of determining the coordinates of a position in a self shift type gas discharge display panel comprising a group of X electrodes connected periodically in common to define subgroups of commonly connected ones of said X electrodes, at least one group of displaying Y electrodes and a corresponding scanning Y electrode, said Y electrodes crossing said X electrodes across a discharge gap, write electrodes crossing said Y electrodes, pulse means for selectively writing, shifting

and sustaining discharge points at said crossing points between said electrodes, light pen means for designating said position whose coordinates are to be determined and for detecting discharge spots at said position, and counter means for determining information concerning the number of write and shift pulses applied prior to such detecting of discharge spots by said light pen, said method comprising:

writing, shifting and displaying information in the form of discharge spots selectively along said displaying Y electrodes by means comprising said writing electrodes crossing with said displaying Y electrodes;

bringing said light pen into sufficient proximity with one of said scanning Y electrodes for designating said position whose coordinates are to be determined,

stopping said writing, shifting and displaying of said information in the form of discharge spots,

firstly operating said pulse means for writing at least one discharge spot into, and shifting said discharge spot(s) along, selected sequential ones of said scanning Y electrodes from each respective one of said crossing points with said write electrode,;

detecting with said light pen said at least one discharge spot being shifted along the one of said scanning Y electrodes in proximity with said pen,

firstly operating said counter means to determine the x coordinate of said position designated by said light pen from the number of said shifts along said proximate scanning Y electrode in, and

recommencing said writing, shifting and displaying of said information in the form of discharge spots along said displaying Y electrodes.

4,188,567

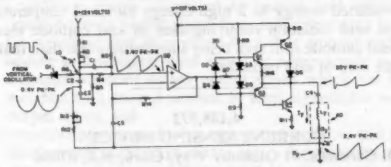
CONSTANT-CURRENT VERTICAL AMPLIFIER

Tex K. Monroe, Batavia, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Oct. 3, 1977, Ser. No. 838,549

Int. Cl.[2] H01J *29/70, 29/72*

U.S. Cl. 315—396 **7 Claims**



1. In a television receiver having a vertical deflection yoke winding and a constant-current vertical amplifier circuit for developing, in response to a current-commanding signal at the amplifier input, a yoke current independent of the yoke impedance, an improved current-sensing feedback resistance comprising:

a first resistor connected between one end of the yoke winding and a reference potential;

a parallel-connected second resistor and first diode connected at one end to the junction of the yoke winding and first resistor;

a third resistor connected between another end of the parallel-connected second resistor and first diode and said potential whereby a feedback voltage is developed across the third resistor and a greater proportion of feedback voltage is developed in response to greater amplitudes of yoke current whereby a substantially S-shaped yoke current waveform is developed in response to a substantially sawtooth current-commanding signal.

4,188,568

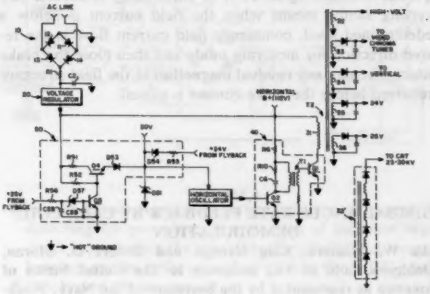
POWER SAVING CIRCUIT

David E. Manners, Alexander, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Aug. 14, 1978, Ser. No. 933,220

Int. Cl.[2] H01J *31/00*

U.S. Cl. 315—411 **12 Claims**



1. In a television receiver having a first voltage source, Horizontal B+, for powering the horizontal output stage and voltage dropping circuit for dropping the value of the Horizontal B+ to a value required to accommodate the horizontal oscillator, a power-saving improvement comprising:

a steering network having one input coupled to the dropping circuit, another input coupled to one of one or more derivative voltage sources derived from a flyback transformer secondary winding and an output coupled to the horizontal oscillator power supply terminal, and

a startup detector coupled to the voltage dropping circuit and also coupled to a derivative voltage source derived from a flyback winding so that during startup of the receiver the supply current for the horizontal oscillator is provided by the Horizontal B+ through the voltage dropping circuit and subsequent to the time at which the voltage developed by the derivative voltage source coupled to the startup detector exceeds a predetermined value, the oscillator supply current is provided by a derivative voltage source.

4,188,569

CONTROL CIRCUIT FOR AN ELECTRIC VEHICLE TRACTION MOTOR

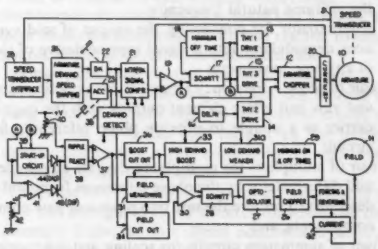
Graeme R. Campbell, Tettenhall, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Dec. 15, 1977, Ser. No. 861,041

Claims priority, application United Kingdom, Dec. 24, 1976, 54179/76

Int. Cl.[2] H02P *3/12*

U.S. Cl. 318—375 **3 Claims**



1. A control circuit for an electric vehicle traction motor having separate armature and field windings, comprising an

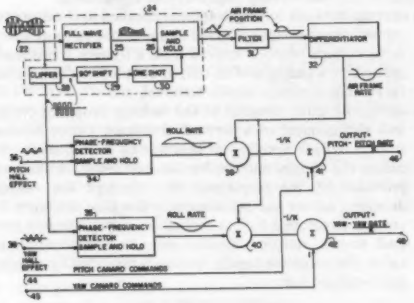
armature winding current control, a braking contact which is in series with the armature winding and which is closed or opened according to whether motoring or braking is required, an alternative path being provided for current generated by the motor during braking, reversing switch means connected in circuit with the field winding, a field current control and logic circuit means arranged to operate during a change from braking mode to motoring mode so as sequentially to reverse said reversing switch means when the field current is below a predetermined level, commence field current flow in the required direction for motoring mode and then close the brake contact whereby any residual magnetism in the field structure is reversed before the brake contact is closed.

4,188,570

GIMBAL ANGLE RATE FEEDBACK BY CAGE COIL DEMODULATION

Blake W. Masters, King George, and Robert D. Moran, Dahlgren, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 28, 1978, Ser. No. 928,921
Int. Cl.[2] G05B 5/01
U.S. Cl. 318—616 **12 Claims**



1. In an automatic guidance system for projectiles or missiles including a guidance gyro having a rotating magnetic mass, a cage coil, pitch and yaw hall effect elements and precession coils, and means for providing guidance commands to pitch and yaw canards, the improvement comprising:

a synchronous demodulator for receiving the cage coil output and for providing a sinusoidal output signal representative of the airframe position relative to the gyro axis, said cage coil output during guidance being a signal with a carrier at the gyro spin frequency and a modulation at the airframe natural frequency;

a differentiator for converting the output of said synchronous demodulator into a signal representative of the rate of airframe movement;

a pair of phase—frequency detectors for sampling the pitch and yaw hall effect element outputs with the cage signal carrier as a sample to provide phase references for the circuit;

a pair of multipliers for multiplying the rate amplitude from said differentiator by the phase references from said phase detectors to resolve the rate into pitch and yaw command components; and

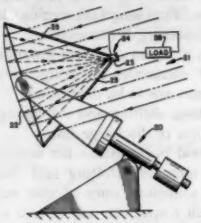
a pair of summation circuits for scaling and subtracting the rate commands provided by said multipliers from the guidance commands to the pitch and yaw canards whereby negative rate feedback is obtained.

4,188,571

RADIANT ENERGY TO ELECTRICAL POWER CONVERSION SYSTEM

Raymond D. Brunson, 9104 Joyce Phillips Ct., Springfield, Va. 22152

Filed Sep. 8, 1976, Ser. No. 721,800
Int. Cl.[2] H02N 3/00, 7/00
U.S. Cl. 322—2 R **23 Claims**



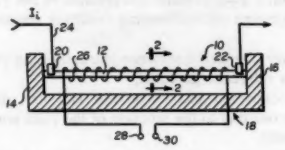
1. In an energy to electrical power transducer for a radiant energy to electrical power conversion system; cathode means having a cathode face; anode means having an anode face; housing means structured to hold said cathode and anode faces as closely spaced faces of said cathode means and said anode means in a highly evacuated vacuum state; said cathode means being of high work function high melt temperature material; said anode being a relatively low work function material; with said cathode face and said anode face spaced no more than approximately 0.002 of an inch apart to minimize space charge buildup and to optimize cross transfer of electrons from cathode to anode in a thermionic conversion process; wherein said cathode means is a relatively thin flat member having said cathode face at one side and a radiation receiving face on a radiation receiving side with both said cathode face and said radiation receiving face held in a vacuum state within said housing means and with said cathode means of high work function high melt temperature material of the class including molyvdenum, niobium, and tungsten for cathode operation with radiant energy cathode means heating up into the range of approximately 2400° to 3600° Kelvin; and means for focusing solar radiated energy to a high energy elevated temperature spot on said radiation receiving face of said cathode means with said cathode spot area being substantially less than that of the face area of said cathode.

4,188,572

CURRENT SENSING DEVICE

Ivan J. Garshelis, 61 Oleander Way, Clark, N.J. 07066

Division of Ser. No. 488,209, Jul. 12, 1974, Pat. No. 3,961,297.
This application Oct. 22, 1975, Ser. No. 624,525
Int. Cl.[2] H01H 55/00
U.S. Cl. 323—9 **5 Claims**



1. A current sensing device comprising a current conductive rod which exhibits magnetic anisotropy in other than a purely circular or longitudinal direction, a conductive coil wound about said rod, and means for applying an alternating current through said rod which is dependent on the size of the current being sensed, said applied alternating current being of suffi-

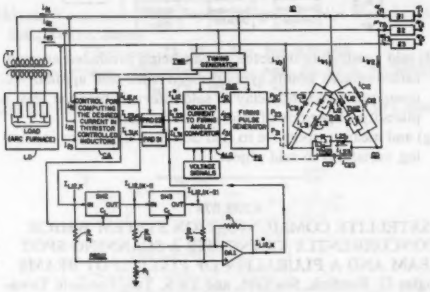
cient magnitude to produce a helical magnetization of said rod in a given direction during one half cycle of said current and for reversing the direction of said helical magnetization during the next half cycle of said current, to produce a change in the linkage of axial flux in said rod with said conduction coil to cause an AC output signal at the terminals thereof.

4,188,573

STATIC VAR GENERATOR WITH TIME-RELATED-ERROR MINIMIZER

Laszlo Gyugyi, Penn Hills, and Michael B. Brennen, Wilkins Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 3, 1978, Ser. No. 892,804
Int. Cl.[2] H02J *3/18*
U.S. Cl. 323—119 **29 Claims**



1. A VAR generator of the type which is connected to an electrical system for the purpose of supplying reactive power to the electrical system, comprising:

(a) calculating means for determining an estimated amount of reactive power that is to be provided to said electrical system during a given period of time, said calculating means providing an estimated reactive power output signal which is related to said estimated amount of reactive power;

(b) predictor means connected to receive said estimated reactive power output signal from said calculating means for weighing said later signal by a first amount and for adding said weighed later signal to a previously stored estimated reactive power output signal which has been weighed by a second amount to form a predictor means output signal; and

(c) reactive power producing means connected to said electrical system and said predictor means for providing reactive power during said time period in correspondence to said predictor means output signal.

4,188,574

AC DETECTOR FOR DC GROUND FAULTS AND HIGH CAPACITANCE IN HIGH-VOLTAGE DC POWER SUPPLIES

Robert W. Allington, Lincoln, Nebr., assignor to Instrumentation Specialties Company, Lincoln, Nebr.

Filed Mar. 27, 1978, Ser. No. 890,071
Int. Cl.[2] G01R *31/02*
U.S. Cl. 324—51 **11 Claims**

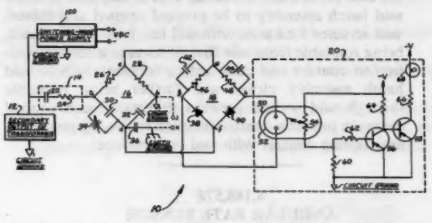
1. The combination of a ground fault detector and a DC power supply comprising:

a power supply transformer having a primary winding for coupling to an AC power source and a secondary winding;

said power supply transformer being part of said DC power supply;

said DC power supply having a floating secondary circuit with a circuit ground and a chassis ground;

means coupled between said secondary winding and circuit ground and responsive to the AC signal from said secondary winding for detecting a relatively low alternating current impedance between said secondary winding of said transformer and chassis ground; and



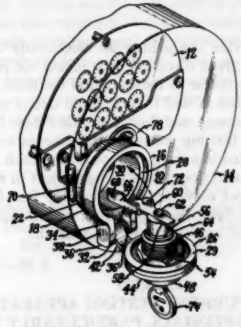
indicator means electrically connected to said means for detecting for providing an indication of said low impedance representing the existence of a ground fault current between a point in the secondary circuit of said DC power supply and chassis ground.

4,188,575

KEY OPERATED METER ACCESS LOCK AND RESET MECHANISM

Ansell W. Palmer, Hampton, N.H., and Francis J. Stevens, North Berwick, Me., assignors to General Electric Company, Somersworth, N.H.

Filed Jun. 9, 1978, Ser. No. 914,218
Int. Cl.[2] G01R *11/64*; G06C *15/42*
U.S. Cl. 324—103 R **17 Claims**



1. In combination with a meter of the type including a register disposed inside a housing, apparatus for gaining access to said register and for carrying out a control function of said register from the outside of said housing comprising:

(a) actuable control means mounted inside said housing, said control means communicating with said register to impart a control function thereto when actuated; and

(b) a register access and control assembly including,

(1) an apertured base extending through said housing and being mounted thereto adjacent said control means, said base having an inside wall formed by the aperture therein, and having a cam surface on the end thereof extending inside said housing,

(2) an apertured hatch assembly pivotally attached to said base and configured to mate therewith when said hatch assembly is pivoted to a closed position and serving to provide access to said register through the aperture of said base when pivoted to an open position,

(3) a rotatable bolt having an actuator-lock arm mounted on one end thereof for coaxial rotation with said bolt,

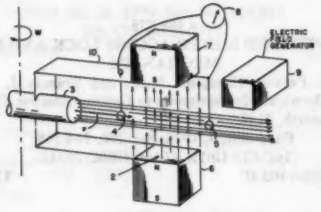
said bolt being mounted in the aperture of said hatch assembly, whereby said actuator-lock arm can extend inside said housing when said hatch assembly is closed, said actuator-lock arm being rotatable with said bolt to a first position whereby said actuator-lock arm clears the cam surface and the inside wall of said base to allow said hatch assembly to be pivoted opened and closed, said actuator-lock arm, with said hatch assembly closed, being rotatable from said first position to a second position to contact said cam surface to securely hold said hatch assembly closed and further being rotatable through said second position to actuate said control means to impart a control function to the register while maintaining contact with said cam surface.

4,188,576

ANGULAR RATE SENSOR

Paul L. Jacobs, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 11, 1978, Ser. No. 941,531
Int. Cl.[2] G01P *3/46*
U.S. Cl. 324—163 **4 Claims**



1. A sensor device comprising an electrically conducting fluid flowing in a given direction; first means for producing a magnetic field transverse to the direction the fluid is flowing; sensor means located in said fluid so as to detect any electric current flowing through said fluid; a nozzle means for ejecting said fluid in a free flowing jet; said nozzle means and said first means are connected in a fixed relationship to each other; said nozzle means and said first means being subject to movements which cause relative movement between the free flowing jet and said magnetic field; and said sensor means detecting the current flow caused by said relative movement.

4,188,577

PULSE EDDY CURRENT TESTING APPARATUS FOR MAGNETIC MATERIALS, PARTICULARLY TUBES

Girish P. Mhatre, Yonkers, and Robert A. Brooks, Rye, both of N.Y., assignors to Magnetic Analysis Corporation, Mount Vernon, N.Y.

Continuation-in-part of Ser. No. 639,796, Dec. 11, 1975, abandoned. This application Dec. 10, 1976, Ser. No. 749,702
Int. Cl.[2] G01N *27/86*
U.S. Cl. 324—220 **19 Claims**

1. Apparatus for the eddy current testing of objects of magnetic material for variations therein which comprises

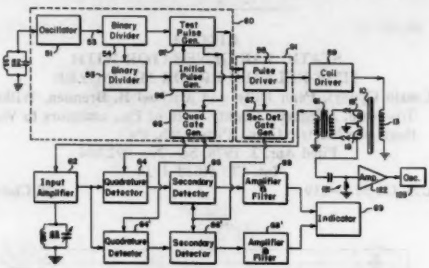
(a) a test head including coil means adapted to be magnetically coupled with a said object to be tested,

(b) means for applying to said coil means intermittent DC voltage pulses for producing magnetic flux in the object and a voltage having a substantial AC component for inducing eddy currents therein,

(c) said AC component occurring at least during respective DC pulses and having a period which is short compared to the duration of a said pulse,

(d) means connected with said coil means for producing a signal corresponding to variations in said eddy currents,

(e) quadrature detecting and gating means for producing quadrature detected signals from said signal at predetermined gated intervals prior to or at the ends of said DC pulses respectively and delayed with respect to the respective initiations of said DC pulses and AC components occurring during the DC pulses,



(f) said quadrature detected signals being produced at quadrature-related points synchronized with said applied AC component and the delay of said intervals being at least a plurality of periods of said AC component,

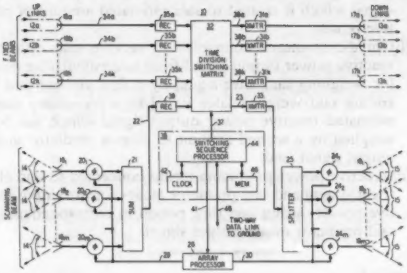
(g) and means responsive to said detected signals for indicating variations in said object.

4,188,578

SATELLITE COMMUNICATION SYSTEM WHICH CONCURRENTLY TRANSMITS A SCANNING SPOT BEAM AND A PLURALITY OF FIXED SPOT BEAMS

Douglas O. Reudink, Sea Girt, and Yu S. Yeh, Freehold Township, Monmouth County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 19, 1978, Ser. No. 907,796
Int. Cl.[2] H04B *7/00*
U.S. Cl. 325—4 **10 Claims**



1. An antenna means for a satellite repeater comprising in combination

a first antenna section (**16***a*–**16***k*, **17***a*–**17***k*) capable of concurrently receiving and transmitting a plurality of k paired first type directional up-link and down-link spot beams of radiated energy (**12***a*–**13***a*; . . . ; **12***k*–**13***k*) containing signals within a predetermined frequency spectrum, where each pair of up-link and down-link directional spot beams is associated with a separate one of a plurality of k spaced-apart first type remote ground station areas; and

a second antenna section capable of concurrently receiving and transmitting a separate second type up-link and down-link beam (**14**, **15**) of radiated energy, respectively, containing signals within the predetermined frequency spectrum for providing communication with plurality of x spaced-apart second type remote ground station areas; characterized in that

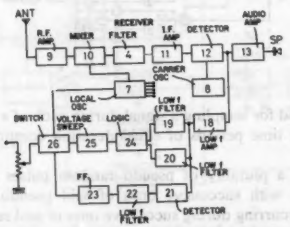
the second antenna section comprises a first portion (18_1-18_m) which is capable of being directionally changeable to scan over the plurality of x second type spaced-apart remote ground station areas in a first predetermined scanning format and in synchronism with the expected arrival of up-link signals from each of the second type spaced-apart remote ground station areas on a time-division multiple access basis, and a second portion (19_1-19_m) which is capable of being directionally changeable to scan over the plurality of x second type spaced-apart remote ground station areas in a second predetermined scanning format and in synchronism with the transmission of signals destined for each of the second type spaced-apart remote ground station areas.

4,188,579

SSB TRANSCEIVER

Akiyuki Yoshisato, Soma, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Aug. 22, 1977, Ser. No. 826,408
Claims priority, application Japan, Aug. 20, 1976, 51/99513
Int. Cl.[2] H04B *1/40*
U.S. Cl. 325—17 **10 Claims**



1. In an SSB transceiver having a transmission mode and a receiving mode, comprising tuning means operable in said receiving mode for adjusting the frequency of a received signal, said tuning means including an oscillator having a variable output frequency which is manually adjustable, the improvement comprising means for producing two pilot signals having predetermined frequencies differing by a predetermined amount, means operable in said transmission mode for superposing said pilot signals on a transmitted signal, means operable in said receiving mode for demodulating such pilot signals from a received signal, means operable in said receiving mode for switching said tuning means from a manual operating mode to an automatic operating mode in response to a signal having a frequency equal to the predetermined frequency difference between said two pilot signals, means including a voltage sweeping circuit for supplying a varying voltage to said oscillator to correspondingly vary the output frequency thereof, control means receiving said pilot signals demodulated from said received signal and stopping the change in output voltage of said sweeping circuit when said pilot signals are of said predetermined frequencies, whereby said tuning means will automatically adjust the frequency of the received signal to that of the transmitted signal.

4,188,580

SECURE COMMUNICATION SYSTEM

Carl R. Nicolai, Seattle, Wash.; William M. Raike, Carmel, Calif., and David L. Miller, Seattle, Wash., assignors to Telesync Corporation, Carmel Valley, Calif.

Filed Oct. 20, 1977, Ser. No. 843,800
Int. Cl.[2] H04K *1/00*
U.S. Cl. 325—32 **16 Claims**

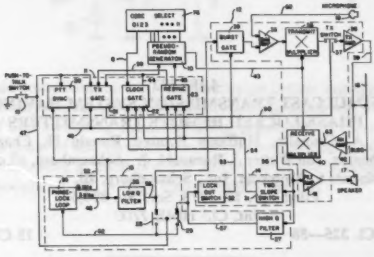
1. A communication system for encoding and decoding a source of information to render the communication of same secure between a transmitting location and a receiving location comprising:

means for generating predetermined user-selectible pseudorandom digital signal codes having pseudorandom first and second states at said transmitting and receiving locations,

means for multiplying the information with one of said codes thereby forming encoded information,

means for transmitting and receiving said encoded information,

means for synchronizing the generation of said pseudorandom code at said transmitting and receiving locations, said transmitting location including means for generating a



synchronizing preamble code for a predeterming period of time whereupon said preamble code becomes a tracking signal said transmitting location including means for transmitting said synchronizing preamble code and said tracking signal, said receiving location including means for detecting when said preamble code has become said tracking signal, thereby initiating generation of said pseudorandom code, said receiving location including means responsive to said tracking signal for maintaining generation of said pseudorandom code at said receiving location thereby maintaining said synchronization, and

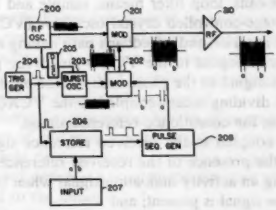
means for recovering the information from said received encoded information.

4,188,581

SIGNALLING SYSTEM

Roy A. Stevenson, 809 E. Tujunga, Burbank, Calif. 91501

Filed May 16, 1977, Ser. No. 796,996
Int. Cl.[2] H03K *5/20*; H04B *1/00*
U.S. Cl. 325—38 R **15 Claims**



1. In a signalling system for alphanumeric data including means for generating a pulse having a length related to a specific alphanumeric symbol;

means for modulating a radio frequency carrier with said pulse to produce a radio frequency signal;

means for transmitting the pulse modulated carrier;

a receiver including means for demodulating the radio frequency signal to detect the received pulse;

the improvement comprising means introducing said pulse into a transmission line having a reflective termination;

said transmission line having at least one detector tap spaced from said termination at a distance related to half the length of said pulse at the propagation rate of the pulse along said transmission line;

means connected to said tap for detecting coincidence between the leading and trailing edge of said pulse; and

means responsive to detected coincidence by said means for detecting coincidence for registering the alphanumeric symbol, corresponding to said top.

4,188,582

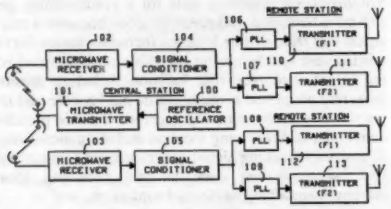
SIMULCAST TRANSMISSION SYSTEM HAVING PHASE-LOCKED REMOTE TRANSMITTERS

Gary A. Cannalte, Hoffman Estates; Ronald H. Chapman, Wheaton, and Walter J. Rozanski, Jr., Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 10, 1978, Ser. No. 894,671

Int. Cl.[2] H04B 7/00

U.S. Cl. 325—58 **15 Claims**



10. In a transmission system for distributing a reference signal from a central station to a plurality of remote stations via communication paths therebetween, each remote station including a signal conditioner for providing a conditioned reference signal from the reference signal received thereat, said signal conditioner comprising:

(a) phase-locked loop means coupled to the received reference signal, said phase-locked loop means including a forward path having phase comparator means, analog switch means, loop filter means, sample and hold means and voltage-controlled crystal oscillator (VCXO) means coupled in series, and a feedback path having a first dividing means coupled to the VCXO means for providing a feedback signal to the phase comparator means;

(b) second dividing means coupled to the VCXO means for providing the conditioned reference signal;

(c) means coupled to the received reference signal for detecting the presence of the received reference signal and providing an activity indication signal when the received reference signal is present; and

(d) control means for opening the analog switch means, enabling the sample and hold means to maintain the frequency of the VCXO means and providing a reset signal to reset the first dividing means to a predetermined state in the absence of the activity indication signal, the control means thereafter closing the analog switch means, enabling the sample and hold means to sample the output of the loop filter means for controlling the frequency of the VCXO means, and removing the reset signal from the first dividing means in response to the presence of the activity indication signal.

4,188,583

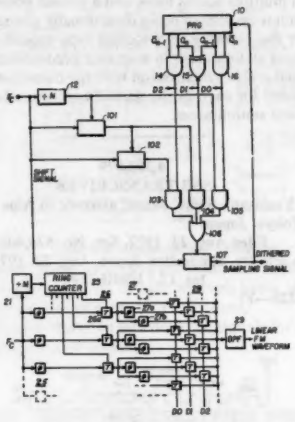
SAMPLING METHOD AND APPARATUSES

Robert J. McCurdy, Cinnaminson, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 23, 1977, Ser. No. 863,904

Int. Cl.[2] H04L 27/12

U.S. Cl. 325—163 **11 Claims**



1. A method for sampling a signal during each of a plurality of successive time periods of equal duration comprising the steps of:

generating a plurality of pseudo random pulses of equal duration with successive ones of said pseudo random pulses occurring during successive ones of said successive time periods of equal duration; and

sampling the signal during each of said pseudo random pulses, the period of a pseudo random pulse during which the sampling occurs being known as a sampling interval, each sampling interval occurring at an essentially random time within said time period, whereby harmonics at the time period recurrence frequency are substantially lessened.

4,188,584

MIXER

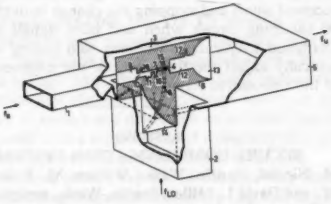
Hendrik Hoogstraate, Delden, Netherlands, assignor to N. V. Hollandse Signaalapparaten, Hengelo, Netherlands

Filed Apr. 20, 1978, Ser. No. 898,472

Claims priority, application Netherlands, Apr. 28, 1977, 7704644

Int. Cl.[2] H04B 1/26

U.S. Cl. 325—446 **6 Claims**



1. A mixer comprising a first waveguide part for transmission of an input signal to be converted to a lower frequency band, a second waveguide part for transmission of a signal supplied by a local oscillator, said first and second waveguide

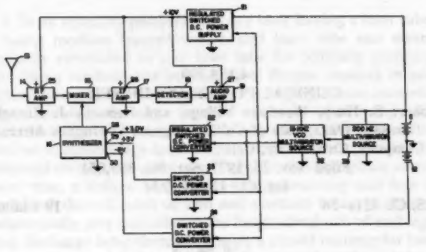
parts opening into a cavity, a substrate positioned in said cavity and a first unencapsulated semiconductor for producing an output signal of frequency (f_M) which is a linear combination of the frequency (f_s) of the input signal and the local oscillator frequency (f_{LO}) mounted on said substrate, said mixer further including a transmission line for said output signal, and at least two microwave integrated circuits provided on said substrate and forming a connection between said first semiconductor and the two waveguide parts said microwave integrated circuit forming the connection between said first semiconductor and said first waveguide part including a slot-line mounted on one side of the substrate which contains therewithin said first semiconductor.

4,188,585

SYNCHRONIZED RECEIVER POWER SYSTEM

Frank A. Wissel, Cincinnati, Ohio, and Charles A. Bucher, Scottsdale, Ariz., assignors to Cincinnati Electronics Corporation, Cincinnati, Ohio

Filed Mar. 16, 1978, Ser. No. 887,669
Int. Cl.[2] H04B 1/16
U.S. Cl. 325—492 **18 Claims**



1. A portable radio receiver adapted to be powered by a battery comprising an IF amplifier having a predetermined center frequency and bandpass, circuit means for supplying signals to and responsive to signals derived from the amplifier, a first switching power converter powered by the battery for deriving a first DC power supply voltage that powers a load including the IF amplifier, a second switching power converter powered by the battery for deriving a second DC power supply voltage that powers another load including at least some of the circuit means, a source powered by the battery for synchronizing the switching of said first and second power supplies at the same time, said synchronizing source having a fundamental and harmonics with substantial amplitude outside of the passband of the circuit means powered by the second power supply and the bandpass of the IF amplifier to minimize spurious signals injected by the power converters into the amplifier and circuit means.

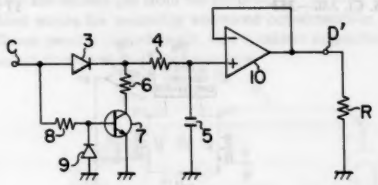
4,188,586

DEMODULATOR CIRCUIT FOR CHOPPER AMPLIFIER

Tsuneyuki Egami, Okazaki, Japan, assignor to Nippon Soken, Inc., Nishio, Japan

Filed Aug. 8, 1978, Ser. No. 932,292
Claims priority, application Japan, Aug. 23, 1977, 52/100884
Int. Cl.[2] G01R 19/18; H02M 7/06; H03D 1/10
U.S. Cl. 329—192 **1 Claim**

1. A demodulator circuit for a chopper amplifier comprising:
a rectifier having an input terminal to receive an amplitude-modulated AC voltage signal,
a smoothing circuit connected to said rectifier and having a serially connected resistor and a capacitor,
said rectifier having a polarity to charge said capacitor during positive half-cycles of said amplitude-modulated AC voltage signal applied thereto,
an operational amplifier having a noninverting input terminal connected to a junction between the resistor and capacitor of said smoothing circuit, an inverting input terminal of said operational amplifier being connected to an output terminal thereof, and
a discharge circuit for the capacitor of said smoothing circuit connected to a junction between said rectifier and



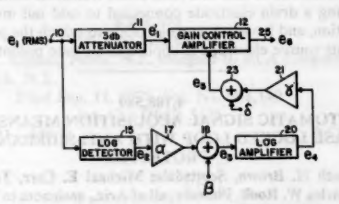
said smoothing circuit, said discharge circuit including a serially connected resistor and switching transistor, a base of said switching transistor being connected to the input terminal of said rectifier whereby to render said transistor conductive at each positive half-cycle of the amplitude-modulated AC voltage signal applied thereto.

4,188,587

LINEAR GAIN CONTROL APPARATUS UTILIZING FEED FORWARD LEVEL CONTROL

James R. Palmer, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 26, 1978, Ser. No. 918,857
Int. Cl.[2] H03G 3/20
U.S. Cl. 330—136 **6 Claims**

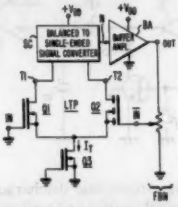


1. Substantially linear gain control apparatus comprising:
(a) gain control amplifier circuitry including cascaded multipliers configured as gain control elements having an input, an output and a control terminal providing a predetermined transfer function therethrough;
(b) logarithmic detector means having an input connected to the input of said gain control amplifier circuitry and an output, said detector means providing a signal at the output thereof which is a logarithmic function of any signals supplied to the input;
(c) logarithmic amplifier means having an input coupled to the output of said detector means and an output coupled to the control terminal of said gain control amplifier circuitry, said logarithmic amplifier means providing an output signal which is a logarithmic function of the logarithmic function of the signal applied to the input thereof; and
(d) means coupled to said logarithmic amplifier means for adjusting the signal applied to the control terminal of said gain control amplifier circuitry to alter the predetermined transfer function to a substantially linear function.

4,188,588
CIRCUITRY WITH UNBALANCED LONG-TAILED-PAIR CONNECTIONS OF FET'S

Andrew G. F. Dingwall, Bridgewater, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 15, 1978, Ser. No. 969,784
Int. Cl.[2] H03F 3/45
U.S. Cl. 330—253 11 Claims



1. In combination:

first and second field effect transistors of the same conductivity type, each having respective gate and source and drain electrodes, said first and second field effect transistors being respectively of depletion-mode and enhancement-mode; and

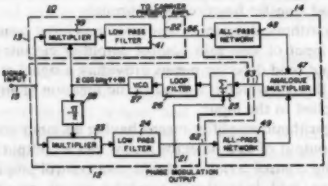
means for connecting said first and second transistors in long-tailed-pair configuration, including means for supplying tail current to an interconnection to which the source electrodes of said first and second field effect transistors connect without substantial intervening impedance, wherein said means for supplying tail current essentially comprises

a third field effect transistor being a depletionmode transistor of the same conductivity type as said first and second field effect transistors, having a source electrode connected to a point of reference potential to which the gate electrode of said first field effect transistor connects, having a drain electrode connected to said tail interconnection, and having a gate electrode to which the potential at its source electrode is applied as its gate potential.

4,188,589
AUTOMATIC SIGNAL ACQUISITION MEANS FOR A PHASE LOCKED LOOP WITH ANTI-SIDEBAND LOCK PROTECTION

Kenneth H. Brown, Scottsdale; Michael E. Carr, Tempe, and Charles W. Rook, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 1, 1978, Ser. No. 939,081
Int. Cl.[2] H03B 3/04
U.S. Cl. 331—12 7 Claims

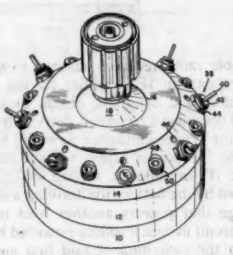


7. Improved automatic signal acquisition means for a phase-locked loop with anti-sideband lock protection including a voltage controlled oscillator, comparison means for comparing an input signal to a signal from the voltage controlled oscillator, filtering means and a summing network connected in a phase-locked loop and providing an output signal at an output thereof at the input of said summing network, a signal multiplying network connected to receive the input signal and a signal from the voltage controlled oscillator in the phase-locked loop for providing a first signal at an output thereof, a multiplier having first and second inputs and an output, and the summing network in the phase-locked loop connected to the output of the multiplier for combining the multiplier output signal with the phase-locked loop output signal, the improvement comprising coupling means including all-pass network means and coupling the output of the signal multiplying network to one input of the multiplier and the output of the phase-locked loop to the other input of the multiplier, said all-pass network means shifting the phase of signals applied thereto so that the signals applied to the inputs of the multiplier are approximately in phase.

4,188,590
CONICAL POWER COMBINER

Robert S. Harp, Westlake Village, and Kenneth J. Russell, Thousand Oaks, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 25, 1977, Ser. No. 855,054
Int. Cl.[2] H03B 7/14
U.S. Cl. 331—56 19 Claims



1. A microwave power combiner comprising:

(a) a conical support structure having an apex region and a conical surface extending from said apex region for receiving a plurality of selectively spaced power sources,

(b) a conical housing structure having a conical surface area or areas thereof facing said conical surface of said support structure and spaced therefrom to define a common waveguide energy propagating region for said power sources,

(c) an inner coaxial conductor joined to said apex region of said conical support structure,

(d) an outer coaxial conductor surrounding said inner coaxial conductor to define an output coaxial line and further joined to said conical surface area or areas of said housing structure,

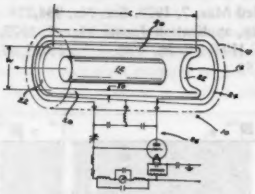
(e) a plurality of microwave power sources selectively disposed at predetermined locations on said conical surface of said support structure, and

(f) microwave circuit means electrically connected and coupled to said power sources for energizing said power sources and for coupling energy from said power sources and via said waveguide region to said coaxial line, whereby the electrical distance between said power sources and said coaxial line is minimized.

4,188,591
RF EXCITED MERCURY LASER LAMP

Anthony E. Siegman; Neil C. Holmes, both of Stanford, and Max T. Artusy, Mt. View, all of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 7, 1977, Ser. No. 840,353
Int. Cl.[2] H01S 3/092
U.S. Cl. 331—94.5 P 6 Claims



1. In an optically pumped mercury laser having a laser tube, a lasing medium located within said laser tube and means operably connected to said laser tube for optically pumping said lasing medium, the improvement therein residing in said optical pumping means, said optical pumping means comprising a mercury discharge lamp in operable relationship with said laser tube, said mercury discharge lamp having a pair of hollow elongated legs spaced apart from each other and being disposed on opposite sides of and lying in the same plane as said laser tube, a hollow end portion interconnecting said legs at each end thereof, each of said end portions being positioned substantially perpendicular to the longitudinal axis of said legs, said discharge lamp thereby forming a closed rectangular loop surrounding and being substantially coaxial with said laser tube, a gas contained within said hollow legs and said end portions of said lamp, a radio-frequency excited coil, said coil being wound around the outside of said lamp in a direction substantially parallel to said legs and said end portions, respectively, of said lamp, thereby being in operable relationship with said lamp and a radio-frequency power supply operably connected to said coil whereby said radio-frequency excited coil forms the primary coil and said lamp forms the secondary coil of an air-core transformer, the current in said lamp being excited entirely by radio-frequency magnetic fields passing through said lamp.

4,188,592
CLOSED CYCLE CHEMICAL LASER

Carl J. Buczek, Manchester, Conn.; Robert J. Freiberg, Palm Beach Gardens, Fla.; David W. Fradin, Exton, Pa., and Peter P. Chenausky, Avon, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 10, 1978, Ser. No. 894,776
Int. Cl.[2] H01S 3/095
U.S. Cl. 331—94.5 G 24 Claims

1. A chemical laser system of the mixing type for continuous wave operation comprising:

a first closed loop through which a gaseous medium may be repeatedly circulated;

means for controllably supplying a first gas to the first closed loop;

a dissociation chamber including means for dissociating at least a portion of the first gas to provide a reaction gas, said dissociating means being downstream of the position at which the first gas is admitted to the first closed loop;

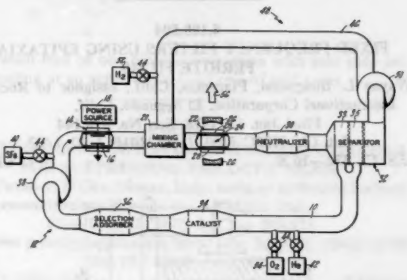
a mixing chamber located downstream the means for dissociating the first gas wherein the mixing chamber is adapted for combining the reaction gas with a second gas to provide a working gas having excited energy levels from which laser radiation can be extracted;

optical means located either immediately downstream of or coincident with the mixing chamber for extracting laser radiation from the working gas;

a neutralizer located downstream the optical means adapted for removing the working gas from the effluent passing therethrough;

a separator located downstream of the neutralizer for separating the second gas from the effluent;

scrubber means for removing undesired constituents in the effluent passing therethrough, said scrubber means being located downstream of the separator;



means for controllably providing a third gas to the first closed loop;

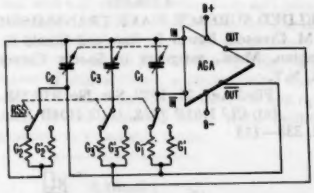
a first circulating means for continuously pumping the effluent through the first closed loop; and

a second closed loop for passing the second gas separated from the effluent by the separator to the mixing chamber wherein the second closed loop includes a second circulating means for pumping the second gas through the second loop and means connected to the second loop for controllably providing the second gas to the second closed loop from a source of second gas.

4,188,593
RC OSCILLATOR

Leonard A. Kaplan, Fords, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 11, 1978, Ser. No. 941,140
Int. Cl.[2] H03B 5/26
U.S. Cl. 331—108 D 9 Claims



1. An RC oscillator comprising:

an amplifier having a high-impedance input circuit between first and second terminals and having an output circuit, and exhibiting a voltage gain of A between its input and output circuits;

a first resistor with a conductance G_1 and a first capacitor with a capacitance C_1 connected in a first series combination;

a secnd resistor with a conductance G_2 and a second capacitor with a capacitance C_2 parallelly connected with each other and said first series combination in a first parallel combination;

a third resistor with a conductance G_3 and a third capacitor

with a capacitance C_3 serially connected with each other and said first parallel combination in a second series combination;

means for applying potential appearing across the output circuit of said amplifier across said second series combination; and

means for applying the potential appearing across said first capacitor to the input circuit of said amplifier to complete a regenerative loop for oscillating at a frequency of ω radians per second.

4,188,594

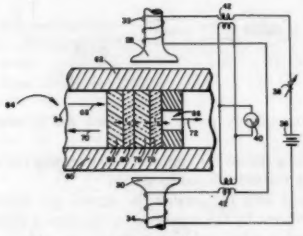
FIXED FREQUENCY FILTERS USING EPITAXIAL FERRITE FILMS

Wayne L. Bongianni, Placentia, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 17, 1978, Ser. No. 870,144

Int. Cl.[2] H03C *3/00, 1/00;* **H01P** *1/20, 1/22*

U.S. Cl. 332—16 R **13 Claims**



1. A filter for electromagnetic waves comprising:

a wave guide;

a thin film of monocrystalline hexagonal ferrite disposed within said wave guide normal to the direction of propagation of radiant energy therein, wherein said thin ferrite film is epitaxially deposited on a single crystal substrate; and

conductive means for reflecting radiant energy incident on and transmitted through said thin ferrite film back through said thin ferrite film.

4,188,595

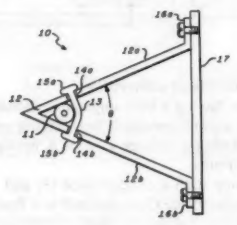
SHIELDED SURFACE WAVE TRANSMISSION LINE

Harry M. Cronson; Basrur R. Rao, and Gerald F. Ross, all of Lexington, Mass., assignors to Sperry Corporation, New York, N.Y.

Filed Aug. 21, 1978, Ser. No. 935,238

Int. Cl.[2] H01P *5/18, 3/10;* **H04B** *7/26*

U.S. Cl. 333—113 **10 Claims**



1. A transmission line apparatus comprising:

a wedge-shaped shield of dielectric material having an internal angle and an external apex formed by the intersection of the two sides thereof;

means positioned within said internal angle for the propagation of surface waves; and

means for maintaining said surface wave propagation means within said internal angle and in contact with each side of said wedge-shaped shield.

4,188,596

ELASTIC SURFACE WAVE DEVICE

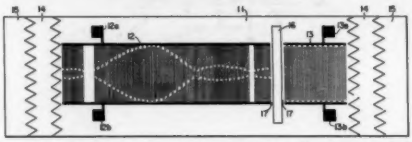
Michiyori Miura, Yokohama, Japan, assignor to Hitachi, Ltd., Japan

Filed Mar. 7, 1978, Ser. No. 884,274

Claims priority, application Japan, Mar. 7, 1977, 52-23812

Int. Cl.[2] H03H *9/26, 9/30, 9/32;* **H01L** *41/04*

U.S. Cl. 333—151 **7 Claims**



1. An elastic wave device comprising a substrate of piezoelectric material, an input electrode disposed on the substrate surface for converting an electrical signal into an elastic surface wave, and an output electrode disposed in an elastic surface wave propagation path on the substrate surface for converting a propagating elastic surface wave into the electrical signal again, wherein at least two kinds of ultrasonic wave absorbing materials are disposed in closely adjacent relation in a region on the substrate surface where neither the input and output electrodes nor the elastic surface wave propagation path exists and where unnecessary elastic surface wave propagate, said ultrasonic wave absorbing materials having different acoustic impedances so that the unnecessary elastic surface wave is scattered at an abrupt change in the acoustic impedance between the ultrasonic wave absorbing materials.

4,188,597

PROCESS FOR THE OPERATION OF A TRANSVERSAL FILTER

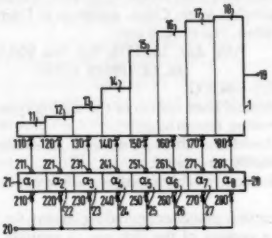
Karl Knauer, Gauting, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 12, 1977, Ser. No. 832,234

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1976, 2644284

Int. Cl.[2] H03H *7/28;* **G11C** *27/00;* **H01L** *29/78*

U.S. Cl. 333—165 **4 Claims**



1. A process for the operation of a transversal filter, wherein the latter is provided with at least one analogue shift register which possesses a plurality of storage positions having parallel inputs and further possesses a series output, wherein a number of individual, predeterminable evaluating circuits is provided, where each evaluating circuit possesses a signal input for the

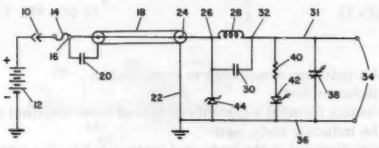
input of the signal to be filtered and an output for providing an output signal weighted according to an evaluation factor, where the output of every evaluating circuit can be connected via a switching element to an associated one of said parallel inputs, wherein the analogue shift register is operated in known manner to effect a charge shift process where charge is shifted toward the series output, wherein the input of every evaluating circuit is connected with the input signal, wherein an evaluating circuit is in each case read into the shift register as a result of the closure of a switching element, and wherein the filtered signal is withdrawn from the series output, characterized in that each evaluating circuit is read-in several times between two consecutive charge shift processes to effect a multiple read-in process, where a charge shift process is in each case carried out between two such multiple read-in processes, and wherein no charge shift process is carried out during each multiple read-in process.

4,188,598

ELECTRICAL FILTER

Morris C. Hunt, 41926 Camino Santa Barbara, Fremont, Calif. 94538

Filed Nov. 7, 1977, Ser. No. 849,181
Int. Cl.[2] H03H *7/10*; H01P *1/20, 7/04*
U.S. Cl. 333—207 **14 Claims**



1. In a band rejection filter for use in the power leads to a radio apparatus, in combination:
- a pair of input terminals and a pair of output terminals;
- the parallel combination of a coil and a capacitor;
- a length of coaxial cable having its center conductor connected, at one end of said cable, to a respectively associated end of said coil;
- the outer conductor of said cable, at said one end of said cable, being connected to one input terminal and to one output terminal;
- the other input terminal being connected to the inner conductor of the cable at the other end of the cable;
- the other end of said coil being connected to the other output terminal; and
- a series circuit including a current limiting resistor connected across said output terminals and magnetically coupled to said coil.

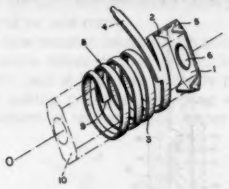
4,188,599

INDUCTANCE COIL FOR TELECOMMUNICATION SYSTEM AND METHOD OF MAKING SAME

Franco Papa, Cusano Milanino, Italy, assignor to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Dec. 15, 1977, Ser. No. 860,836
Claims priority, application Italy, Dec. 17, 1976, 30517 A/76
Int. Cl.[2] H01P *7/00*; H01F *15/10, 27/78*
U.S. Cl. 333—219 **8 Claims**

1. An inductance coil for high-frequency filtering, comprising:
- a helical body with several turns consisting of a flat metal strip with broad faces wound about an axis parallel to said broad faces, said strip terminating in a free end;
- an enlarged terminal tab of one piece construction with said strip adjoining said body opposite said free end and lying substantially perpendicular to and centered on said axis; and



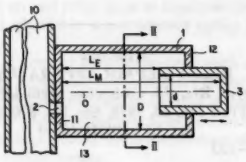
- a branch lead of one piece construction with said strip extending at an acute angle from one of said turns.

4,188,600

CAVITY RESONATOR HAVING ANCILLARY CYLINDER FOR SUPPRESSING PARASITIC MODE

Enzo Cavalieri D'Oro, Monza, Italy, assignor to Società Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Dec. 23, 1977, Ser. No. 863,623
Claims priority, application Italy, Dec. 24, 1976, 30852 A/76
Int. Cl.[2] H01P *1/16, 706*
U.S. Cl. 333—228 **5 Claims**



1. A cavity resonator comprising:
- a hollow cylindrical body of conductive material forming a resonant cavity provided at one end with an inlet for coupling said cavity to a guide path traversed by microwaves of a predetermined operating frequency, said cavity being substantially closed at its opposite end; and
- a solid ancillary conductive cylinder of smaller inner diameter than said cavity inserted into said opposite end, said cylinder being provided with an open end confronting said inlet and with a closed end farther from said inlet than said opposite end, said cavity being dimensioned to sustain a preferred mode of propagation for microwaves in a frequency band centered on said operating frequency, the inner diameter of said ancillary cylinder being less than that required for the propagation of waves at said operating frequency in said preferred mode while facilitating such propagation in a parasitic mode.

4,188,601

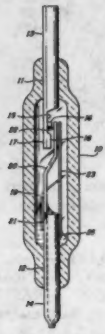
MERCURY-WETTED RELAY CONSTRUCTION

Larry L. Wiese, Pickerington, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 13, 1978, Ser. No. 951,123
Int. Cl.[2] H01H *29/00*
U.S. Cl. 335—51 **8 Claims**

1. A mercury-wetted relay construction comprising a magnetic pole-piece member **(11)**, a magnetic stem member **(12)**, means **(10)** for oppositely supporting said stem and pole-piece members, said last-mentioned members presenting corresponding first and opposite, second sides, an electrical contact **(16)** mounted on the end and on said first side of, said pole-piece member **(11)**, a substantially flattened "Z" shaped armature **(20)** presenting oppositely extending legs, and a magnetic hinge **(19)** for flexibly mounting said armature member **(20)** to said

stem member (12) to extend one leg of said armature member in a spaced-apart relation over said contact (16), characterized in that said hinge (19) is affixed to the other, opposite leg of said armature member (20) to position said last-mentioned leg



adjacent the end, and on said second side of, said stem member (12) and in that a nonmagnetic bumper member (23) is mounted on said first side of said stem member to extend along said one leg of said armature member (20) in a spaced relation with said one leg.

4,188,602

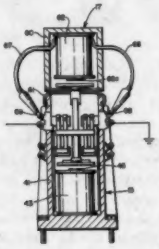
RELAY REPAIR APPARATUS

Cecil E. Shroyer, Rte. #3, Coshocton, Ohio 43812

Filed Jan. 20, 1978, Ser. No. 870,938

Int. Cl.[2] H01H *45/04*

U.S. Cl. 335—132 **10 Claims**



1. For use with an electrical relay of a variety including a housing, an electrical coil mounted within said housing and energizable from a source connectable with electrical contacts positioned upon said housing, a movable member within said housing for selectively carrying out switching logic, having a first biased switching position and movable to a second switching position upon the energization of said coil, said movable member including a projecting portion movable therewith and said housing having an opening over which may be mounted a cap, said cap, when so mounted, being situated at a location adjacent said movable member projecting portion, the improved auxiliary assembly comprising:

a casing mountable over said opening;

an auxiliary electrical coil mounted within said casing;

means for connecting said auxiliary electrical coil with said source when said casing is mounted over said opening; and

an operative member mounted within said casing, extensible to said movable member where said casing is mounted over said opening and having a first position exhibiting no operational influence over said movable member such that said movable member is in said first biased switching position when said auxiliary coil is unenergized, said operative member being movable into a second position in contact against said movable member projecting portion when said auxiliary coil is energized from said source to cause said movable member to move to said second switching position.

4,188,603

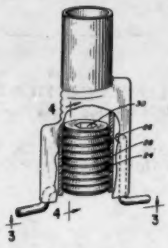
INDUCTOR WITH CONDUCTING CORE OF SINTERED POWDERED METAL

Peter A. Tsoutsas, Orland Park, Ill., assignor to Permacor, Inc., Oak Lawn, Ill.

Filed Jul. 26, 1978, Ser. No. 928,063

Int. Cl.[2] H01F *21/04*

U.S. Cl. 336—75 **5 Claims**



1. An inductor comprising in combination

an inductor body,

a winding forming a plurality of helical turns disposed about the inductor body, and

a core disposed in the body and surrounded by the winding, the core being formed of sintered aluminum powdered metal.

4,188,604

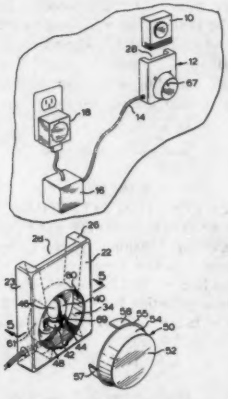
THERMOSTAT REGULATOR

Richard C. Maybee, Burlington, Canada, assignor to Polygauge Industries Ltd., Oakville, Canada

Filed Oct. 17, 1977, Ser. No. 842,563

Int. Cl.[2] H01H *37/16*

U.S. Cl. 337—377 **7 Claims**



1. A regulator for wall thermostats, comprising:

a housing adapted to be affixed to a wall under a thermostat, the housing defining within it a passage for air, the passage

having an inlet and an outlet with the inlet situated below the outlet,

a manually rotatable member at least partly translucent and mounted to the housing in the path defined by said passage, the rotatable member defining a passageway which may be adjusted by rotating the member to positions between that of alignment with said passage and that of blocking said passage; the rotatable member including two part-cylindrical partitions each covering about 90° of arc, and being spaced apart by intervals of about 90°, the housing defining a cylindrical guideway in which said partitions can rotate, the guideway being part of said passage, the passage having side walls which intersect the guideway so as to open through about 90° of the cylinder, whereby each partition is able to assume a position in which the passage is completely blocked,

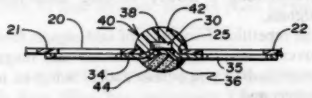
and means including a light source within the passageway of the member for simultaneously (a) heating the air within said passageway thus promoting convective flow from the inlet to the outlet, and (b) illuminating said rotatable member.

4,188,605

ENCAPSULATED HALL EFFECT DEVICE

Glenn M. Stout, 2000 Argonne Dr., Columbia Heights, Minn. 55421

Filed Jul. 21, 1978, Ser. No. 926,658
Int. Cl.² H01L *43/04*
U.S. Cl. 338—32 H **15 Claims**



1. An encapsulated Hall effect device comprising:

a thin substrate with an aperture;

a semiconductor chip, having a plurality of connection leads and including a Hall effect element having a sensing surface, said chip being disposed in registration with the aperture; and

encapsulation material surrounding the chip and aperture, the encapsulation material comprising:

a nonmagnetic portion of the encapsulation material surrounding the sensing surface of the chip, and

a magnetically active portion of the encapsulation material surrounding the surface of the chip opposite the sensing surface, said magnetically active portion of the encapsulation material comprising a mixture of a finely divided magnetic conductor material and a binder,

whereby the chip is fully enclosed by the nonmagnetic and magnetically active portions of the encapsulation material.

4,188,606

PHASEABLE IMPEDANCE DEVICE

Richard L. Bomar, Riverside, and Jesus Duarte, Pomona, both of Calif., assignors to Bourns, Inc., Riverside, Calif.

Filed Oct. 31, 1977, Ser. No. 846,951
Int. Cl.² H01C *10/00*
U.S. Cl. 338—137 **9 Claims**

1. In combination:

a rotor to be used with a variable impedance device;

a fixed wiper contact spring mounted upon said rotor;

at least a pair of locator and heat staking pegs formed on said rotor for positioning and fastening said fixed wiper contact spring thereto;

a plurality of heat staking patches for securing said fixed wiper contact spring to said rotor;

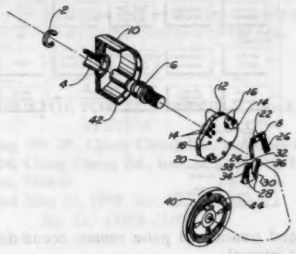
a first pick-off element contact member integral with and forming a part of said fixed wiper contact spring;

a first output contact member integral with and forming a part of said fixed wiper contact spring;

an adjustable wiper contact spring mounted upon said rotor;

at least one critically positioned pivot point heat staking peg formed on said rotor;

a pivot arm member, integral with and forming a part of said adjustable wiper contact spring, having an aperture to receive said at least one critically positioned pivot point heat staking peg and permitting small angular pivotal movement of said adjustable wiper contact spring about



said at least one critically positioned pivot point heat staking peg;

a latch formed on said rotor so as to constrain pivotal movement of said adjustable wiper contact spring to the plane of said rotor;

a second output contact member integral with and forming a part of said adjustable wiper contact spring;

a second pick-off element contact member integral with and forming a part of said adjustable wiper contact spring; and

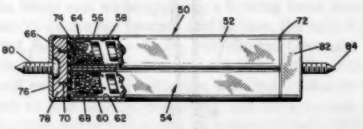
means employing said latch, to fix the position of said adjustable wiper contact spring.

4,188,607

VARIABLE IMPEDANCE DEVICE

David L. Cannom, 276 Cabrillo #C, Costa Mesa, Calif. 92627, and Carlos M. Del Rio, Pipila No. 113, Irapuato, Guanajauto, Mexico

Filed Dec. 1, 1978, Ser. No. 965,683
Int. Cl.² H01C *8/00*
U.S. Cl. 338—224 **11 Claims**



1. A variable impedance device comprising a pair of electrodes electrically interconnected by a length of a compacted conductive mixture of granulated silica and the metal constituents of bronze, and enclosure means for retaining said mixture.

4,188,608

FISH DETECTION APPARATUS

Joseph D. Richard, 3613 Loquat Ave., Miami, Fla. 33133

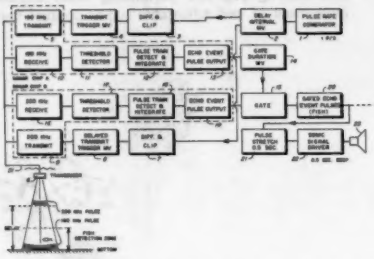
Filed Jun. 19, 1978, Ser. No. 916,704
Int. Cl.² G01S *9/70*
U.S. Cl. 367—93 **8 Claims**

1. In an echo sounder for selectively detecting fish within a predetermined depth zone relative to the bottom in a body of water, apparatus for excluding signals indicative of bottom echoes comprising:

means for transmitting first and second ultrasonic pulses into a body of water, said ultrasonic pulses being separated by a predetermined time delay interval;

means for receiving ultrasonic echo signals from within the aforementioned body of water resulting from reflections of the said ultrasonic pulses;

means for providing a gate interval initiated by the repeption of the first bottom echo from among the said received echo signals, said gate interval having a predetermined time duration not exceeding the said delay interval so that signals indicative of bottom echoes resulting from the said



second transmitted pulse cannot occur during the said gate interval;

means for selectively detecting echo events which occur during the said gate interval from among the said received echo signals; and

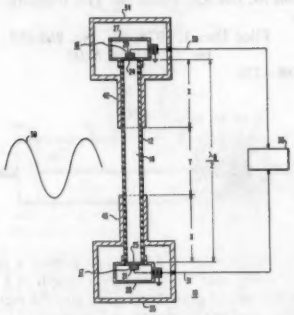
means for activating a sensible signal in response to said detected echo events to indicate the presence of fish within the aforementioned predetermined zone relative to the bottom.

4,188,609

LOW FREQUENCY HYDROPHONE

Gerald Mott, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 10, 1978, Ser. No. 904,697
Int. Cl.[2] H04B *13/00*
U.S. Cl. 367—152 **16 Claims**



1. a low frequency hydrophone comprising:

(a) an elongated, compliant, fluid-filled tube member;

(b) transducer means coupled to said tube member at at least one end thereof;

(c) said tube member being for immersion in the ambient water to be exposed to acoustic waves of frequency f and wavelength λ_A;

(d) the impingement of said acoustic waves on said tube member causing a corresponding pressure wave of frequency f and wavelength λ_B in said fluid in said tube member, where $\lambda_B < \lambda_A$;

(e) said transducer means providing an output signal in response to said pressure wave in said fluid in said tube member;

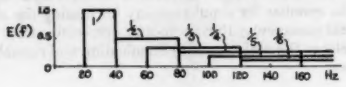
(f) the length of said tube member from said transducer means to the other end thereof being in the order of $(n\ \lambda_B/2)$ where n is an odd integer.

4,188,610

METHOD OF AND APPARATUS FOR THE GENERATION AND TRANSMISSION OF SIGNALS FOR ECHOLOCATION AND OTHER SIGNALLING PURPOSES, SUCH AS IN GEOPHYSICAL EXPLORATION

David E. Nelson, Rochester, N.Y., assignor to Hydroacoustics, Inc., Rochester, N.Y.

Filed Aug. 29, 1977, Ser. No. 828,698
Int. Cl.[2] G01V *1/14, 1/28*
U.S. Cl. 367—14 **87 Claims**



66. For use in echolation systems for seismic exploration, the method of generating from signals having broad bandwidth which extend over a frequency range used in such systems, a transmission having an autocorrelation function in which side lobes are substantially suppressed, said method comprising

deriving said signals from a plurality of sources operating in harmonically locked relationship with each other, each source transmitting a slowly varying, quasi-repetitive train of signals,

sweeping the repetition frequency of said signals from said sources over N frequency bands within said range, said bands not exceeding one octave and N being an integer including one, and

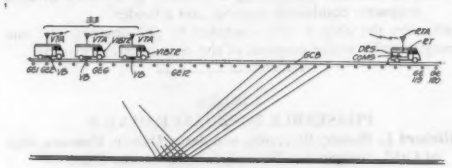
timing the transmissions from said sources to be in such phase relationship that harmonics of the signals from any of said sources which are produced more than once are suppressed.

4,188,611

SEISMIC PROSPECTING SYSTEM

Charles M. Edwards, and William C. Walter, both of Pasadena, Calif., assignors to United Geophysical Corporation, Pasadena, Calif.

Continuation of Ser. No. 304,476, Nov. 7, 1972, abandoned. This application Jan. 9, 1978, Ser. No. 867,967
Int. Cl.[2] G01V *1/36*
U.S. Cl. 367—41 **4 Claims**



1. In a method of seismic surveying, the method of generating, receiving, and processing seismic wave signals that comprises:

a. storing a seismic source wave signal of variable frequency in the form of a series of digital signals in integer-mode format;

b. exciting the earth in accordance with said source signal to cause seismic wave signals of corresponding variable frequency to be generated in the earth over an extended period of time whereby such seismic waves travel downwardly into the earth and are deflected by subsurface formations;

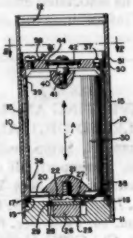
c. receiving seismic waves deflected by such subsurface formations at a spread of geophone stations;
d. converting the seismic waves received at the respective geophone stations into a series of digital signals multiplexed in accordance with a second, or data receiver, floating-point format;
e. converting said series of received digital signals into a set of series of digital signals multiplexed in a third, or compositing, floating-point format;
f. repeating steps (b) to (e) for successive trains of received seismic waves that travel over approximately the same paths, thereby producing corresponding sets of digital signals multiplexed in said third, or compositing, floating-point format;
g. compositing said sets of digital signals to produce a final set of composited signals multiplexed in said third, or compositing, format;
h. reformatting said sets of multiplexed composite signals to produce a final set of said multiplexed signals in said second, or data receiver, floating-point format;
i. also reformatting said set of multiplexed composite signals to store them in said first, or source signal, integer-mode format;
j. cross-correlating said series of seismic source wave digital signals that were recorded in said first, or source signal, format with said set of composite signals after they have been reformatted in said first, or source signal, format while both said series of seismic source wave digital signals and said set of composited signals are in integer mode, to produce a set of cross-correlated signals; and
k. reformatting said set of cross-correlated signals to produce a final set of multiplexed correlated signals in said second, or data receiver, floating-point format.

4,188,612

PIEZOELECTRIC SEISMOMETER

James D. Kerr, Allen, Tex., assignor to Teledyne Industries Inc. (Geotech Division), Dallas, Tex.

Filed May 1, 1978, Ser. No. 901,680
Int. Cl.² G01V *1/16*
U.S. Cl. 367—160 **6 Claims**



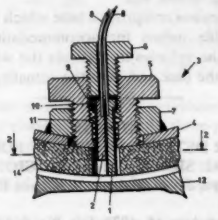
1. A seismometer for delivering signals representing vibrational displacements along an axis of sensitivity, comprising:
a frame extending about said axis;
a rigid vibratory mass in the frame disposed along said axis and having first and second axially spaced ends;
means for restoring the position of the mass in the frame consisting essentially of one spring disc assembly having a disc of spring metal disposed opposite said first end of the mass and fixed at its center thereto to support said first end and yieldably to oppose displacements of the mass in both directions along said axis, and said restoring means further including a piezoelectric disc having one face conductively bonded to a face of the metal disc, and having an electrode bonded to the other face of the piezoelectric disc and operative to deliver said signals, the composite of the metal disc and piezoelectric disc providing the stiffness of the spring disc assembly;
mounting means supported on the frame and tightly clamping the edge of the metal disc all the way around its periphery to hold said edge in a plane normal to the axis, whereby when the mass displaces the central portion of the metal disc from said plane the central portion will flex in one direction and an annular portion of the metal disc nearer its periphery will flex in the opposite direction, the piezoelectric disc overlying said central portion of the metal disc and the ratio of the diameter of the piezoelectric disc to the diameter of the metal disc being about 0.68; and
constraining means coupled to the second end of the mass and attached to the frame and operative to constrain the mass to displacements in the direction of the axis.

4,188,613

SAFETY INDICATOR FOR AUTOMOBILE BRAKING SYSTEM

Chieh-Pang Yang, No. 28, Chang Cheng Rd., and Chia-Hsiang Wong, No. 314, Chang Cheng Rd., both of Kuong Fu Hsiang, Hualien Hsien, Taiwan

Filed May 31, 1978, Ser. No. 911,067
Int. Cl.² G08B *21/00*
U.S. Cl. 340—52 A **1 Claim**



1. An indicator for a braking system which utilizes a lining affixed to a support shoe comprising: a first conductor bar embedded within the lining and supported by the shoe, said first conductor bar has a terminal portion flush with the brake lining, insulation means electrically isolating said conductor bar from the shoe, a conductor wire leading from said conductor bar to a bulb, a source of power connected to said bulb and connected to a ground, and a ground on a surface against which the lining acts while applying a braking force whereby when said conductor bar touches said surface, the bulb will be illuminated, a second conductor bar shorter than said first conductor bar and fastened thereto such that said first conductor bar will provide a first indication, a second conductor wire connected to said second conductor and to a second bulb which is connected to said source of power whereby said first indication shows that the brakes do work, and the second conductor bar shows lining wear said first and second conductor bars are carried in said lining by means of a base member surrounding said bars defined by a body fastened to said shoe, an adjusting screw threadedly disposed within said body, an insulative washer below said adjusting screw, said bar members are below said washer and are provided with a flange which abuts against said washer whereby the adjusting screw orients said conducting bars.

4,188,614

REMOTE CYCLE ALARM SYSTEM

Fred G. Habib, Jr., 6231 W. Newport, Chicago, Ill. 60634

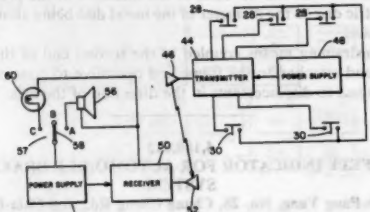
Filed Oct. 6, 1977, Ser. No. 839,985
Int. Cl.² B60R *25/10*
U.S. Cl. 340—63 **8 Claims**

1. A remote cycle alarm system for preventing theft of vehicles comprising:

housing means being positioned on a support surface for co-operative engagement with a wheel of a vehicle;

actuating means being disposed on said housing means for generating contact closures;

transmitter means disposed on said housing means and being responsive to said acutating means upon a contract closure;



receiving means for receiving the transmitted signals by the transmitting means at a remote distance away from said transmitting means; and

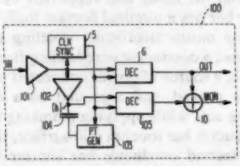
said housing means comprises a base which is provided with an adjustable means for accommodating various size wheels of the vehicles to maintain the wheel in a central portion of the base and over the actuating means.

4,188,615

BIT ERROR DETECTING CIRCUIT FOR USE IN A DIGITAL SIGNAL TRANSMISSION LINE

Yoichi Tan, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Aug. 15, 1978, Ser. No. 933,924
Claims priority, application Japan, Aug. 15, 1977, 52-97048
Int. Cl.[2] G08C *25/00*
U.S. Cl. 340—146.1 R **4 Claims**



1. A bit error detecting circuit comprising:

clock signal recovery means responsive to an input digital signal transmitted through a transmission line for reproducing a clock signal from said input digital signal;

a first decision circuit for deciding a binary code of said input digital signal in accordance with a first reference level and for producing a decision output in response to said clock signal;

a pattern generating circuit responsive to said clock signal for generating a predetermined binary code pattern;

an adder circuit for adding said binary code pattern to said input digital signal;

a second decision circuit for deciding a binary code of the output from said adder circuit in accordance with a second reference level and for producing a decision output in response to said clock signal; and

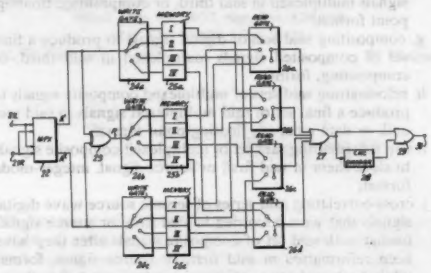
an Exclusive-OR circuit having an Exclusive-OR function of the outputs of said first and second decision circuits, whereby a fault on said transmission line is detected before said first decision circuit produces a bit error.

4,188,616

METHOD AND SYSTEM FOR TRANSMITTING AND RECEIVING BLOCKS OF ENCODED DATA WORDS TO MINIMIZE ERROR DISTORTION IN THE RECOVERY OF SAID DATA WORDS

Shin-Ichi Kazami, Tokyo, and Toshitada Doi, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 15, 1978, Ser. No. 905,894
Claims priority, application Japan, May 16, 1977, 52-56142
Int. Cl.[2] G06F *11/10, 11/12*
U.S. Cl. 340—146.1 AL **42 Claims**



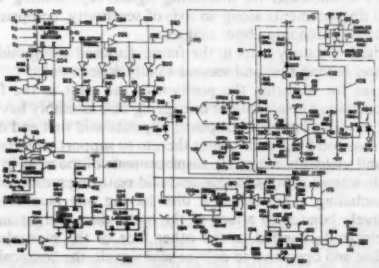
1. A method of transmitting encoded data words, each data word being formed of a multiple of bits, said method comprising the steps of generating a plurality of data blocks and a row of parity bits included in each data block, each data block including a plurality of rows of information bits, and a given parity bit being associated with corresponding ones of information bits in said rows of information bits in said block; generating respective error correcting codes associated with respective rows in each block; and serially transmitting each data block by transmitting said rows of information bits and associated error correcting codes and said row of parity bits and associated error correcting code such that said row of parity bits and associated error correcting code is preceded by a row of information bits and its associated error correcting code and is followed by a row of information bits and its associated error correcting code.

4,188,617

SYSTEM FOR CONVERTING ANALOG SIGNALS TO MULTIPLEXED DIGITAL DATA

Jess F. Fauchier; William H. Seipp, both of Bettendorf, and Stephen E. Whiteside, Davenport, all of Iowa, assignors to Gulf & Western Industries, Inc., New York, N.Y.

Continuation of Ser. No. 727,792, Sep. 29, 1976, abandoned. This application Jun. 16, 1978, Ser. No. 916,287
Int. Cl.[2] G08C *15/06*
U.S. Cl. 340—183 **4 Claims**



1. A module for use in a programmable controller having a control processing unit with output address lines, a selected

number of input/output bi-directional data lines, means for creating a write signal in a write line and means responsive to said write signal for writing data from said data lines into selected addressed locations, said module comprising: means for receiving at least two analog voltage signals; a signal converting circuit for converting an analog voltage signal at a circuit input to an output analog signal at a circuit output, said output analog signal being capable of conversion into digital data by an external analog to digital conversion circuit; means for selectively activating said module by a given coded address in said address lines of said central processing unit; a signal selecting means for selecting one of said analog voltage signals in response to the simultaneous appearance of a write signal in said write line, said given address in said address lines and a signal selecting code in said data lines, said signal selecting code corresponding to the particular analog voltage signal to be selected; means for applying only said selected analog voltage signal to said circuit input of said signal converting circuit; means for creating a select signal only when one of said analog voltages has been selected; said module having output lines directed to said external conversion circuit and a single switching means for connecting said circuit output of said signal converting circuit to said output lines when said switching means is in a first condition and for electrically isolating said output lines of said module from said circuit output of said signal converting circuit on said module when said switching means is in a second condition; means for shifting said switching means into the first condition only when said select signal is in existence and means for shifting said switching means into the second condition when said select signal is not present.

4,188,618

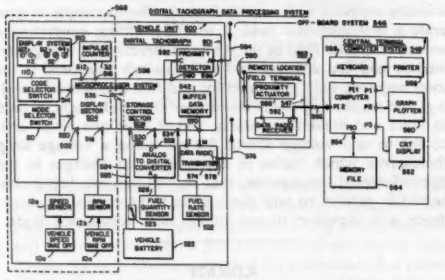
DIGITAL TACHOGRAPH SYSTEM WITH DIGITAL MEMORY SYSTEM

Emanuel S. Weisbart, 99-60 63rd Rd., Forest Hills, N.Y. 11374

Continuation-in-part of Ser. No. 449,708, Mar. 11, 1974, Pat. No. 3,950,700, which is a continuation-in-part of Ser. No. 157,964, Jun. 29, 1971, Pat. No. 3,835,382. This application Apr. 8, 1976, Ser. No. 674,851

Int. Cl.[2] G08G *17/00*

U.S. Cl. 340—201 R **36 Claims**



1. A digital tachograph system for recording performance of a vehicle comprising detection means adapted for location entirely on-board said vehicle and operative to continuously detect the dynamic vehicle performance characteristics thereof including vehicular velocity thereof as a function of time and to produce a continuous stream of vehicle characteristic versus time data signals corresponding to said detected characteristics; digital display means operative to selectively display the instantaneous value of said vehicle performance characteristics; data memory means adapted for location on-board said vehicle and operative to continuously receive and record said vehicle characteristic data signals representing said vehicle characteristic data; fixed base computer terminal means including central terminal computer means, and data transmission means operative to selectively transmit said vehicle characteristic data from said vehicle data memory means to said central terminal computer means; said central terminal computer means being operative upon receipt thereof via said data transmission means to selectively read out said vehicle characteristic data.

4,188,619

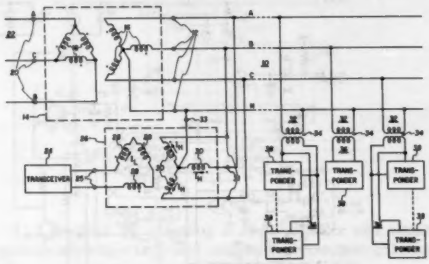
TRANSFORMER ARRANGEMENT FOR COUPLING A COMMUNICATION SIGNAL TO A THREE-PHASE POWER LINE

William C. Perkins, Garland, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 17, 1978, Ser. No. 934,449

Int. Cl.[2] H04B *3/54, 3/56*

U.S. Cl. 340—310 R **3 Claims**



1. A transformer arrangement for simultaneously coupling a signal to all three phase conductors of a three-phase power line having a neutral conductor comprising:

a low voltage set of three like windings serially connected, with one end of each of two of said windings being disconnected;

a high voltage set of three like windings connected in a neutral wye configuration to the power line;

means for magnetically coupling each winding of one set with a different winding of the other set so that a current through said low voltage set of windings causes currents to flow through the windings of said high voltage set in the same direction with respect to the neutral connection, and

means for applying the signal to be coupled to the power line across the disconnected ends of the two windings of the first set.

4,188,620

PHASE DECODER

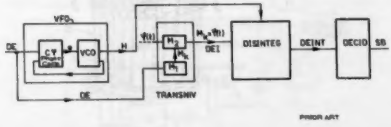
Jean-Claude Lamare, Ezanville, and Christian Maury, Velizy, both of France, assignors to Compagnie Internationale pour l'Informatique, Paris, France

Filed Nov. 9, 1978, Ser. No. 959,097

Claims priority, application France, Nov. 14, 1977, 77 34162

Int. Cl.[2] H03K *13/24*

U.S. Cl. 340—347 DD **8 Claims**



1. Apparatus for integrating a series of bi-level electric bits, comprising at least one integrator containing a capacitive integrating member, a device for controlling the integrator responsive to the series of bits for controlling the duration and direction of charging current flowing in the capacitive member as a function of the direction and duration of each individual bit in the series, a circuit for resetting the integrator to zero at

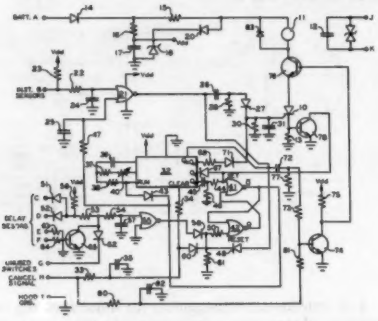
the end of each integrating operation of each bit, a generator responsive to the repetition rate of the bits for supplying the capacitive integrating member with a charging current proportional to the nominal frequency F_O of the bilevel bits.

4,188,621

ALARM SYSTEM

James D. Heckelman, Norwalk, and Robert A. Ziemke, Sandusky, both of Ohio, assignors to Dan-Mar Co. Inc., Huron, Ohio

Filed Jan. 18, 1978, Ser. No. 870,337
Int. Cl.[2] B60R *25/00*; G08B *13/22*
U.S. Cl. 340—528 **16 Claims**



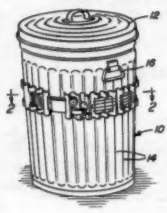
1. A control circuit comprising: a pulse generator providing first and second output signals at spaced apart time intervals, said pulse generator having a clearing terminal and a pause terminal, switch means having start and stop inputs and an output connected to said pause terminal of said pulse generator, said switch means starting said pulse generator when said start input is energize and stopping sadi pulse generator after a first predetermined time period when said stop input is energized, said stop input being actuated by said first pulse generator output signal, and a controlled device actuated by said second output signal after a second predetermined time period when said pause terminal is not actuated by said stop input.

4,188,622

GARBAGE CAN ALARM

Larence G. Miller, 1499 Ringe La., Las Vegas, Nev. 89110, and Rowland B. Purmal, 39 Lowery, Henderson, Nev. 89015

Filed Jan. 27, 1978, Ser. No. 873,411
Int. Cl.[2] G08B *13/12*
U.S. Cl. 340—571 **8 Claims**



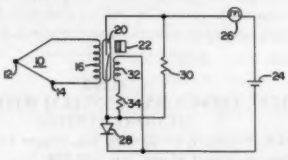
1. In combination, an elongated stiff but bendable strap assembly constructed of shape retentive but deformable and resilient dielectric material and including first and second sides and longitudinally spaced transversely extending corrugations and being adapted to encircle an upright trash can constructed of conductive material with said first side opposing the outer surface of said trash can, said corrugations including ridges spaced along said first side for abutting engagement with said can and said assembly including longitudinally spaced openings formed therethrough, said strap assembly including anchor means for releasably securing said strap assemby in position extending about said can, a conductor member threaded through selected corrugations and spaning said openings, and battery and electrically actuatable signal means supported from said strap assembly, open circuit means serially connecting said battery, signal means and said conductor member and including contact means disposed outwardly of said one side of said assembly for electrical contact with said can, said conductor member being adapted to engage said can and close said circuit means.

4,188,623

TEMPERATURE RESPONSIVE APPARATUS EMPLOYING A THERMOCOUPLE

Seiko Suzuki; Masahiro Takasaka; Toru Sugawara, and Toru Takahasi, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 28, 1977, Ser. No. 819,993
Claims priority, application Japan, Jul. 28, 1976, 51/89198; Aug. 27, 1976, 51/101614
Int. Cl.[2] G08B *17/06*
U.S. Cl. 340—595 **22 Claims**



1. A temperature responsive apparatus comprising a voltage source, a thermocouple producing a thermoelectric e.m.f. depending on the temperature difference between the temperature to be detected and the circumferential temperature, a first winding supplied with current from the thermocouple to generate a first magnetic field, a second winding generating a second magnetic field in the opposite direction to that generated by said first winding, and a reed switch positioned in the total magnetic field generated by said first and second windings and responding to the intensity of the total magnetic field to make and break its contacts, and at least one diode connected to said voltage source for providing a voltage drop thereacross which varies in dependence on changes in the circumferential temperature, said second winding being connected in parallel to said diode so as to be excited in accordance with variations in said voltage drop across said diode.

4,188,624

METHOD AND APPARATUS FOR MONITORING FLUID FLOW THROUGH A DRILL STRING

Dennis H. Hochsprung, Houston; Alan C. Wright, Bellaire; Robert I. Annas, Spring, and Pat W. Purcell, Houston, all of Tex., assignors to NL Industries, Inc., New York, N.Y.

Filed Jun. 30, 1978, Ser. No. 921,100
Int. Cl.[2] G08B *19/00*
U.S. Cl. 340—606 **26 Claims**

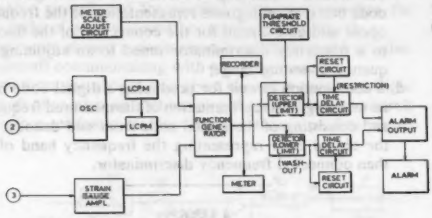
1. An apparatus for monitoring fluid flow through a drilling string comprising:

first input producing means for producing a first input signal having a magnitude and proportional to a rate of pumping fluid through a drilling string;

second input producing means for producing a second input signal having a magnitude and proportional to a pressure of fluid being pumped;

a function generator responsive to said first and said second

input signals for generating a fluid flow indication signal; and



alarm signal generating means responsive to the fluid flow indication signal, for generating an alarm signal when the fluid flow indication signal is outside a predetermined range.

4,188,625

GAS DISCHARGE DISPLAY ARRANGEMENT

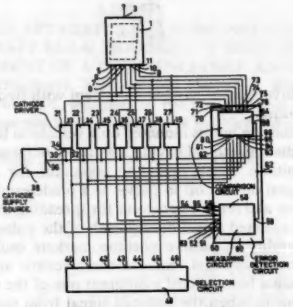
Andreas M. L. Hodemaekers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 30, 1978, Ser. No. 873,732

Claims priority, application Netherlands, Feb. 18, 1977, 7701799

Int. Cl.[2] G08B *21/00*

U.S. Cl. 340—642 **13 Claims**



1. A gas discharge display arrangement comprising a plurality of symbol display elements each having a plurality of display segments, said display segments having a common anode and separate cathodes, a plurality of cathode drivers which couple the cathodes to a terminal for connection to a cathode supply source, a selection circuit having a plurality of selection signal outputs respectively coupled to individual inputs of said cathode drivers, an error detection circuit including an error signal output for an electric error signal, a measuring circuit having a plurality of energizing signal outputs for electric energizing signals and a measuring signal output for an electric measuring signal, and means coupling each energizing signal output of the measuring circuit to an energizing signal input of a corresponding cathode driver and the measuring signal output to the error signal output of the error detection circuit, the amplitude of an output signal of the measuring circuit being a measure of the sum of the amplitudes of the electric energizing signals applied by the measuring circuit to the cathode drivers, the amplitude of an energizing signal at a selected display segment being a function of the amplitude of the current through this display segment.

4,188,626

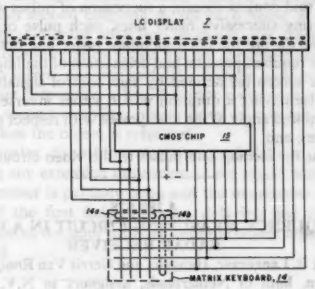
METHOD FOR SCANNING A KEYBOARD AND FOR ACTUATING A DISPLAY DEVICE VIA COMMON CONDUCTORS

Gene A. Frantz, Irving, and George L. Brantingham, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 23, 1977, Ser. No. 799,807

Int. Cl.[2] G06F *3/14*

U.S. Cl. 340—711 **6 Claims**



1. A method for actuating a display device and simultaneously scanning a keyboard, said method comprising the steps of:

(a) communicating A.C. voltages to the segments of a segmented display device via a set of display conductors, the A.C. voltages being of a greater RMS value for those segments which are being actuated than for those segments which are not being actuated;

(b) communicating a series of keyboard scanning pulses on a first subset of said display conductors, each of said first subset of said display conductors being coupled to a respective one of the switches of said keyboard; and

(c) sensing the occurrence of said keyboard scanning pulses on a second subset of said display conductors, each of said second subset of said display conductors being also coupled to a respective one of the switches of said keyboard.

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DISPLAY APPARATUS

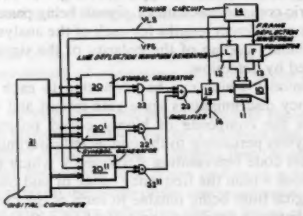
Alfred J. Alexander; David J. Jibb, and Graham Hollaway, all c/o Century Works, Lewisham, London, SE. 13, England, assignors to Elliott Brothers (London) Limited, Essex, England

Continuation-in-part of Ser. No. 37,201, May 14, 1970, abandoned. This application Mar. 28, 1972, Ser. No. 238,962

Claims priority, application United Kingdom, May 14, 1969, 24653/69; Dec. 24, 1969, 62816/69

Int. Cl.[2] G06K *15/20*

U.S. Cl. 340—747 **9 Claims**



1. Apparatus for displaying line symbols on a screen of a cathode ray comprising:

line and frame deflection waveform generators for scanning the cathode ray tube screen in a raster of lines forming a frame;

a video circuit for the application to the cathode ray tube of signals to control the brightness of the cathode ray tube display;

means for producing control signals defining the position and orientation on the screen of a line symbol required to be displayed;

symbol generating means for producing, under the control of said control signals, a succession of pulses which occur during successive raster lines, each pulse occuring at a time during the corresponding raster line determined by the required position and orientation of the line symbol on the screen (as defined by said control signals) and each pulse having a duration which varies inversely with the required angle of the line symbol with respect to the raster lines; and

means for feeding said pulses to the video circuit.

4,188,628

FREQUENCY MEASURING CIRCUIT IN A PASSIVE RADAR RECEIVER

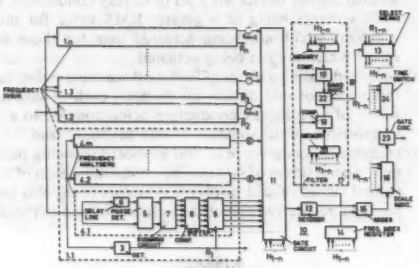
Huibert B. Langeraar, Hengelo, and Gerrit Van Rooijen, Haaksbergen, both of Netherlands, assignors to N.V. Hollandse Signaalapparaten, Hengelo, Netherlands

Filed Apr. 20, 1978, Ser. No. 898,460

Claims priority, application Netherlands, Apr. 26, 1977, 7704526

Int. Cl.[2] G01S 9/02

U.S. Cl. 343—5 SA **13 Claims**



1. Frequency measuring circuit in a passive radar receiver for producing a digital code representing the frequency of an r.f. signal received by the radar receiver, wherein the frequency measuring circuit comprises:

a. a number (N) of frequency discriminators, each having an ambiguous discriminator characteristic, which discriminators are tuned to different r.f. frequency ranges, partly overlapping each other if they are tuned to adjoining frequency operating ranges, and which discriminators incorporate a plurality of frequency analysers for the phase detection of the applied r.f. signals in two trigonometric components, said r.f. signals being passed via delay lines of different lengths for each of the analysers, and for the binary coding of the polarity of the signals thus obtained by detection;

b. a decoder which can be connected to each of the frequency discriminators via a gate circuit and which converts the composite of binary coded polarities of the analysers pertaining to the connected discriminator into a digital code representing a frequency which may be ambiguous within the frequency range of said discriminator;

c. a digital filter being tunable to each of the discriminators and having a passband corresponding with the unambiguous part of the relevant discriminator characteristic, which digital filter delivers a signal on the application of the digital code from the decoder to indicate whether the binary representation of the frequency value within the frequency operating range of said discriminator is ambiguous or not, which digital filter, after receiving a digital code being an ambiguous representation of the frequency opens said gate circuit for the connection of the decoder to a frequency discriminator tuned to an adjoining frequency operating range;

d. a combination circuit for producing a digital code being an unambiguous representation of the measured frequency and consisting of the digital code from said decoder and the digital code representing the frequency band of the then connected frequency discriminator.

4,188,629

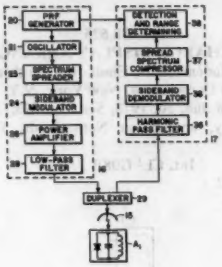
PASSIVE NAVIGATION SYSTEM WITH FREQUENCY CODING

Robert H. Johnson, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 19, 1976, Ser. No. 706,659

Int. Cl.[2] G01S 9/233, 9/56

U.S. Cl. 343—6.5 R **6 Claims**



1. A passive marker navigation system with frequency coding comprising:

(a) transmitting means mounted on a vehicle to be navigated for radiating a signal having a plurality of frequencies said transmitting means including apparatus for modulating the signal on and off in pulses at a predetermined repetition rate and further apparatus for spreading the spectrum of the radiated signal during each of the pulses;

(b) a plurality of passive position markers each having a non-linear electrical response characteristic and tuned to reradiate a harmonic of a different one of the plurality of frequencies when the radiated signal from said transmitting means impinges thereon;

(c) said markers being fixedly mounted at predetermined positions relative to a desired course to be traveled by the vehicle; and

(d) receiving means mounted on the vehicle for receiving the reradiated spread spectrum harmonics, compressing and detecting the reradiated spread spectrum harmonics, discriminating between said markers, and determining the range from the vehicle of each of said reradiating markers.

4,188,630

METHOD OF AND SYSTEM FOR AVOIDING COLLISIONS BETWEEN AIRCRAFT

Ljubimko Milosevic, Paris, France, assignor to Thomson-CSF, Paris, France

Continuation-in-part of Ser. No. 939,228, Sep. 5, 1978, abandoned, which is a continuation of Ser. No. 694,245, Jun. 9, 1976, abandoned. This application Nov. 16, 1978, Ser. No. 961,099

Claims priority, application France, Jun. 10, 1975, 75 18059

Int. Cl.[2] G01S 9/44

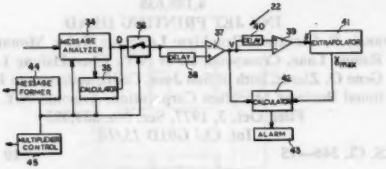
U.S. Cl. 343—9 R **6 Claims**

1. A method of avoiding collision between aircraft carrying

navigational equipment for the periodic transmission, during a recurrent time slot individually allotted to each aircraft in a given area, of data relating to altitude, course and speed of the respective aircraft and for plotting from received data the flight paths of nearby aircraft, comprising the steps of:

monitoring aboard a given aircraft the flight paths of other aircraft communicating with said given aircraft;

upon detecting aboard said given aircraft a presumed flight path of another aircraft crossing that of said given aircraft with a minimum closing time less than a predetermined



safety threshold, initiating a direct exchange of messages at an accelerated rate between said given aircraft and said other aircraft;

determining aboard said given aircraft, from said direct exchange, the distance D of said aircraft from said given aircraft and the variation ΔD of said distance D from one exchange cycle to the next;

calculating aboard said given aircraft a passing distance s from the parameters D and ΔD; and

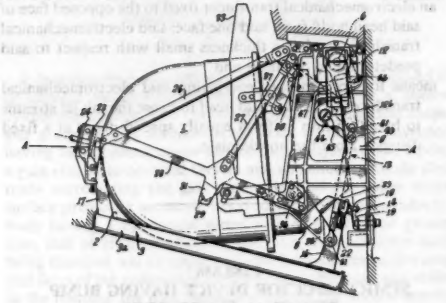
taking collision-avoiding measures upon said passing distance s having less than a predetermined magnitude.

4,188,631

LINKAGE APPARATUS FOR SYNCHRONIZING AIRCRAFT DOOR MOVEMENTS WITH THE DEPLOYMENT OF A DOOR-ENCLOSED ANTENNA

Richard H. Dougherty, Tarzana, and Thomas E. Fealy, Burbank, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 13, 1978, Ser. No. 915,345
Int. Cl.² H01Q *1/28*
U.S. Cl. 343—705 **9 Claims**



1. Apparatus for opening and closing a door member and for synchronously extending and retracting a deployable object normally carried in a door-enclosed storage area of a support structure comprising:

an elongate drive shaft,

means for rotatably driving said shaft in opposite directions,

a crank shaft carried by said shaft,

a first and second pair of lever arms rigidly carried by and having different lengths extending radially outwardly of said crank shaft for pivotal movement therewith,

separate and independent first and second linkage systems,

a first means pivotally coupling said first linkage system to the outer end of said first lever arm, and

a second means pivotally coupling said second linkage system to the outer end of said second lever arm,

said first linkage system engaging said door member for swingably opening and closing it responsively to said bi-directional rotational movements of said drive shaft and said second linkage system engaging said normally stored object for swingably extending and retracting it responsively to said same bi-directional rotational movements,

said first and second coupling means each being pivotally driven by said crank shaft into an overcenter disposition when rotated in one direction but not the other; said first coupling means moving said first linkage system to an overcenter disposition when the door member is opened and the second coupling means to an overcenter disposition when the object is retracted,

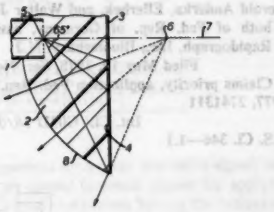
said overcenter disposition of the second linkage system delaying any extension movement of the object until said door member is partially open and the overcenter disposition of the first linkage system delaying any closing movement of the door member until the object is partially retracted.

4,188,632

REAR FEED ASSEMBLIES FOR AERIALS

Dennis M. Knox, Felixstowe, England, assignor to Post Office, London, England

Continuation of Ser. No. 649,975, Jan. 19, 1976, abandoned. This application Sep. 2, 1977, Ser. No. 830,139
Claims priority, application United Kingdom, Jan. 21, 1975, 2580/75
Int. Cl.² H01Q *19/08, 19/18*
U.S. Cl. 343—753 **7 Claims**



1. A splash plate feed assembly for a microwave aerial comprising a support member of a dielectric material, the member having a convex front face facing the aerial and a rear face facing away from the aerial, an energy reflecting planar surface positioned against said rear face, waveguide means coupled to said support member, the waveguide means having a circular aperture at one end, the centre of the aperture forming the phase centre of the assembly and the distance between said phase centre and said reflecting surface being not less than $8a^2/\lambda_e$ where

a is the radius of the waveguide aperture and

λ_e is the wavelength of microwave radiation in the support member

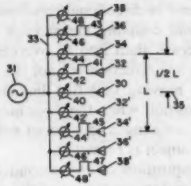
a plurality of radiation paths extending from said phase centre to said energy reflecting surface and back through said convex face, said support member being so shaped that the electrical lengths of said paths from said phase centre to a spherical wavefront centred on the image phase centre are equal and the dimensions of said energy reflecting surface being at least 8 times the diameter of said waveguide means to ensure that all radiation emitted by the waveguide means within 65° of the axis thereof is reflected by said surface.

4,188,633

PHASED ARRAY ANTENNA WITH REDUCED PHASE QUANTIZATION ERRORS

Richard F. Frazita, Deer Park, N.Y., assignor to Hazeltine Corporation, Greenlawn, N.Y.

Filed Jan. 26, 1978, Ser. No. 872,525
Int. Cl.[2] H01Q *1/50*; H04B *7/00*
U.S. Cl. 343—854 **12 Claims**



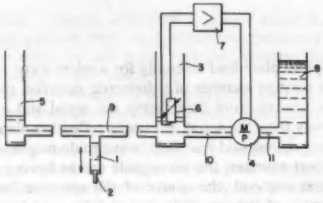
1. A phased array antenna system, comprising:
an aperture having a plurality of antenna element pairs, the elements of each pair being oppositely located with respect to a plane passing through said aperture;
and coupling means for supplying wave energy signals to said elements, said coupling means including digital phase shifters for varying the phase of said wave energy signals in discrete phase steps, the phase length of said coupling means being selected so that wave energy signals supplied to the elements in each pair have a phase-difference which is always approximately an odd-integral multiple of one-half the smallest phase step of said phase shifters.

4,188,634

METHOD FOR REGULATING INK FLOW IN DRAFTING PENS

Gerold Anderka, Ellerbek, and Walter Jozat, Bad Bramdstedt, both of Fed. Rep. of Germany, assignors to Koh-I-Noor Rapidograph, Inc., Bloomsbury, N.J.

Filed May 19, 1978, Ser. No. 907,536
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1977, 2741311
Int. Cl.[2] G01D *18/00*
U.S. Cl. 346—1.1 **8 Claims**



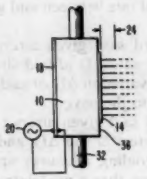
1. Method for regulating ink flow in drafting pens of the type having a tubular writing pen which is communicant with an open ended main reservoir, at one end, and communicant with the tip of a capillary writing tube at its other end, comprising the steps of:
A. Pumping ink from said reservoir into the tubular pen and towards the writing tip of said tube;
B. Buffering ink flow from said reservoir into said tubular pen by defining an open-ended ink buffer chamber which is in ink communication with the reservoir and the writing tip;
C. Gauging the level of ink intermediate said main reservoir and said writing tip by monitoring the ink level in an open-ended intermediate reservoir which is between said writing tip and said main reservoir; and
D. Modifying pumping as the gauged, actual level of ink within said intermediate reservoir deviates from a desired level.

4,188,635

INK JET PRINTING HEAD

Francis P. Giordano, Brooklyn; Lawrence Kuhn, Mount Kisco; Ramon Lane, Crompond, all of N.Y.; Chen-Hsiung Lee, and Gene O. Zierdt, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 3, 1977, Ser. No. 839,093
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—75 **10 Claims**



1. A multi-nozzle ink jet head comprising:
a head body comprising a member having opposed faces separated by a predetermined distance, said head body having an ink inlet passage and at least one ink slot communicating with said inlet passage and extending to only one of the faces of the head body;
a nozzle plate having a plurality of orifices therein; said nozzle plate being fixed to said one face of said head body with its orifices in alignment with said ink slot so that a row of ink jet streams is formed when pressurized ink is introduced into said ink inlet passage;
an electromechanical transducer fixed to the opposed face of said head body from said one face; said electromechanical transducer having a thickness small with respect to said predetermined distance; and
means for continuously energizing said electromechanical transducer to vibrate said head to cause the ink jet streams to break up into uniform equally spaced drops at a fixed distance from the nozzle plate.

4,188,636

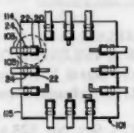
SEMICONDUCTOR DEVICE HAVING BUMP TERMINAL ELECTRODES

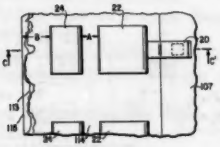
Susumu Sato, and Hiroshi Shiba, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1978, Ser. No. 891,182
Claims priority, application Japan, Apr. 1, 1977, 52-36996
Int. Cl.[2] H01L *23/48, 29/44, 29/52*
U.S. Cl. 357—71 **17 Claims**

1. A semiconductor device comprising; a semiconductor substrate, an insulating film covering at least a portion of the surface of said substrate, a bump terminal electrode formed on a portion of said insulating film, and a protrusion formed between said bump terminal electrode and the peripheral edge of said semiconductor substrate opposing said bump terminal

electrode, said protrusion being separated from said bump terminal electrode by a predetermined distance, and a lower





surface of said protrusion being directly attached to said insulating film.

4,188,637

DISC-SHAPED SEMICONDUCTOR DEVICE HAVING AN ANNULAR HOUSING OF ELASTOMER MATERIAL

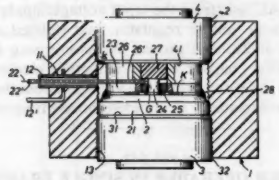
Heinrich Gerstenköper, and Heinz Juchmann, both of Warstein, Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 6, 1977, Ser. No. 813,409

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1976, 2630320

Int. Cl.[2] H01L *23/42, 23/44, 23/46*

U.S. Cl. 357—79 **6 Claims**



1. In a disc-shaped semiconductor arrangement composed of an annular housing of elastomer material having a hollow cylindrical interior, two contacting discs of cylindrical shape, and a disc-shaped semiconductor body defining a thyristor, having two opposed major surfaces, one major surface having a gate electrode centered therein and an annular cathode electrode surrounding the gate electrode, and the other major surface providing an anode electrode, and the semiconductor body having a cylindrical shape with a diameter no greater than that of either contacting disc, the semiconductor body being clamped, via its major surfaces, between respective axial end faces of the contacting discs, and being hermetically sealed in the housing, the improvement wherein: the hollow interior of said housing has the form of a circular cylinder; the diameter of the interior of said housing, when said housing is unstressed, is smaller than the diameter of each of said contacting discs; said contacting discs, with said semiconductor body clamped therebetween, are press fitted into the interior of said housing; the elastomer material of said housing has physical properties such that said housing acts on said contacting discs in a manner to maintain pressure contact between said contacting discs and the major surfaces of said semiconductor body and to establish a hermetic seal in the space defined between said contacting discs; and said arrangement further comprises means defining a gate electrode connector in the form of a silver disc contacting said gate electrode; a molded body of elastomer material disposed in said housing interior for establishing a pressure contact between said connector and said gate electrode, via the contacting discs, an annular silver ring aligned with, and contacting said cathode electrode, a conductive lead connected to said silver disc and extending radially through said housing, a Teflon sleeve enclosing said lead, a centering ring of insulating material disposed between said silver disc and said silver ring, and a copper ring aligned with, and contacting, said silver ring and having an outer diameter substantially corresponding to that of said silver ring and an inner diameter greater than that of said silver ring, said copper ring being further provided with a radially extending slit for passage of said sleeve and said lead, and wherein said molded body of elastomer material is press fitted into the interior of said copper ring for pressing said silver disc against said gate electrode, and said silver ring, said silver disc, said sleeve, said copper ring and said molded body are all interposed between said one major surface of said semiconductor body and an associated one of said contacting discs.

4,188,638

COLOR TELEVISION SIGNAL HAVING COLOR-DIFFERENCE SIGNALS ALTERNATING BETWEEN TWO CARRIERS

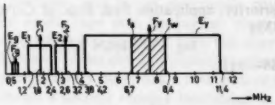
Maarten R. de Haan, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 585,387, Jun. 9, 1975, abandoned. This application Aug. 4, 1978, Ser. No. 930,906

Claims priority, application Netherlands, Apr. 22, 1975, 7504733

Int. Cl.[2] H04N *9/38, 5/76*

U.S. Cl. 358—4 **12 Claims**



Ln	1	2	3	4	5	
E_1	R-Y	B-Y	R-Y	B-Y	R-Y	
E_2	B-Y	R-Y	B-Y	R-Y	B-Y	

1. A transmission apparatus for a color television signal, said apparatus comprising an output terminal, means for applying to said terminal a first signal component having the luminance information of said color television signal, first and second modulator means for respectively applying second and third color signal components having first and second color carrier frequencies respectively to said terminal, said second and third components occupying separate frequency bands, and means for line sequentially interchangeably applying to said modulators first and second color signals of said color television signal.

4,188,639

VIDEO SYNCHRONOUS DETECTOR APPARATUS

Toshio Murakami, Yokohama; Masaru Noda, Fujisawa; Hiroaki Nabeyama, Kamakura, and Takeshi Murakami, Yokohama, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 20, 1977, Ser. No. 862,622

Claims priority, application Japan, Jan. 7, 1977, 52-347

Int. Cl.[2] H04N *9/50*

U.S. Cl. 358—25 **5 Claims**

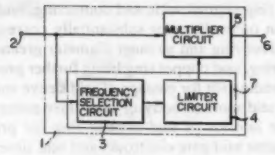
1. A video synchronous detector apparatus comprising:

a first terminal for receiving a video intermediate frequency signal;

a multiplier circuit having two inputs and an output, one of said two inputs being connected to said first terminal; and

a picture-carrier intermediate frequency extraction circuit connected between said first terminal and the other of said two inputs;

said picture-carrier intermediate frequency extraction circuit comprising a limiter circuit and a frequency selection circuit having a trap circuit, a resonance frequency of said



trap circuit being equal to a differential frequency between a picture-carrier intermediate frequency and a differential frequency between a sound-carrier intermediate frequency and a color subcarrier intermediate frequency to reduce disturbances caused by a beat between the sound-carrier intermediate frequency and a side band component of the video intermediate frequency signal.

4,188,640

APPARATUS FOR MAKING LAMINAR RADIOGRAMS

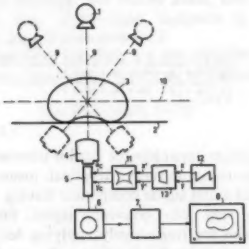
Jürgen Dittrich, Marschacht; Jürgen Heinzerling; Dietrich E. Meijer, both of Hamburg; Ralf Möllendorf, Ahrensburg, and Friedrich Wolf, Marschacht, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 21, 1977, Ser. No. 862,689

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658331

Int. Cl.² H04N *5/32*

U.S. Cl. 358—111 **6 Claims**



1. An apparatus for producing laminar radiograms, including an X-ray radiator and an image recording device mounted to image a subject at different positions with the optical axis of the image recording device maintained parallel to the central ray of the X-ray radiator, the image recording device including an image intensifier and a television camera for recording images of said image intensifier, and further including a superposition device coupled to the television camera for forming laminar radiograms corresponding to images in a laminar plane by superposing individual images which have been shifted by determined amounts with respect to one another; the improvement comprising a correction means coupled to reduce distortion resulting from the structure of aid image recording device, and further comprising deflection signal modifying means for modifying deflection signals in said apparatus as a function of the laminar angle α and the orbit angle φ to correct for geometric distortion resulting from the slope between the input screen of the image intensifier and the laminar plane, the orbit angle φ being the angle between the projection of the central ray on the laminar plane and the X-axis, and the laminar angle α being the angle between the central ray and the normal to the laminar plane.

4,188,641

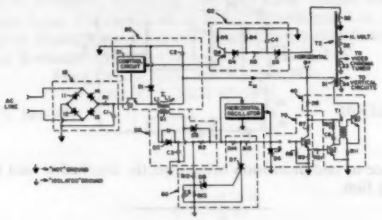
STARTUP CIRCUIT FOR A TELEVISION RECEIVER

Scott H. Baker, Brockport, and David E. Manners, Alexander, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jul. 28, 1978, Ser. No. 928,670

Int. Cl.² H04N *5/44*

U.S. Cl. 358—190 **18 Claims**



1. A television receiver comprising:

an input voltage supply for developing an input voltage, the supply being derived from and electrically coupled to the AC line and returned to a Hot ground;

a switching voltage regulator coupled to the input supply and returned to the Hot ground for providing a regulated output voltage to a load circuit, the regulator comprising an inductive element across which appears a voltage alternating at a predetermined frequency and through which flows a current varying at that frequency;

and an isolated startup voltage supply electrically isolated from the AC line, from the input voltage supply and from the switching voltage regulator, said isolated supply returned to an Isolated ground and comprising a winding magnetically coupled to the inductive element of the switching regulator so that the voltage across the winding varies at substantially the predetermined frequency.

4,188,642

CCD IMAGER OPERABLE IN SINGLE FRAME AND REPETITIVE FRAME MODES

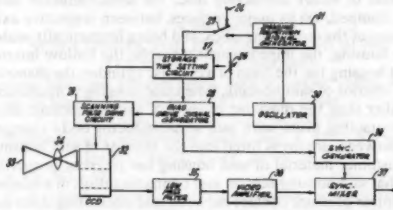
Masanobu Morishita; Hidehiko Inoue; Takao Ando, and Mitsuru Kawasaki, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 597,990, Jul. 22, 1975, abandoned. This application Apr. 28, 1977, Ser. No. 792,012

Claims priority, application Japan, Jun. 23, 1974, 49-84490

Int. Cl.² H04N *3/14*

U.S. Cl. 358—213 **4 Claims**



1. A solid-state imaging apparatus comprising means for accumulating charges corresponding to incident light rays during periods determined by a bias signal and having charge

storage means for storing and transferring said accumulated charges in response to a first transfer drive signal, and readout register means for transferring said charges in response to a second transfer drive signal;

means coupled to said charge-coupled device for producing said bias signal and for applying said bias signal to said converting means of said charge-coupled device;

means coupled to said bias signal producing means for establishing a predetermined period of said bias signal to determine said period for which said charges are accumulated;

means for producing said first and second transfer drive signals to be applied to said charge storage means and said readout register means, respectively;

means for selecting between a single image mode and a repetitive image mode;

means responsive to said selecting means for changing the repetition frequencies of said first and second transfer drive signals; and

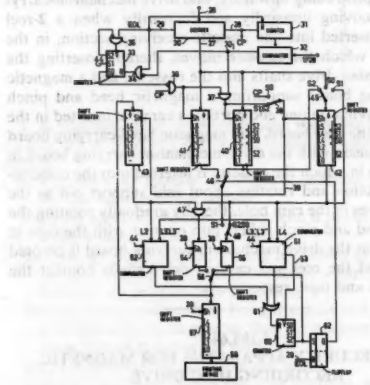
read-out means for obtaining the video signal from said charge-coupled device.

4,188,643

METHOD AND ARRANGEMENT FOR CORRECTING ERRORS IN FACSIMILE TRANSMISSION

Raymond G. Schayes, Brussels, Belgium; Pieter Homan, Hilversum, Netherlands, and Ulf Rothgordt, Norderstedt, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 26, 1977, Ser. No. 836,503
Int. Cl.[2] H04N *1/38*
U.S. Cl. 358—280 **16 Claims**



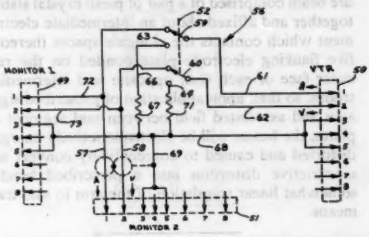
1. A method for correcting errors in line by line facsimile transmission, said errors creating a disturbed picture line having undisturbed remaining portions, said method comprising comparing the number of picture elements in a line with a predetermined number, shifting said line relative to a correctly received line upon determining that said number of elements is not equal to said predetermined number so that the beginning and end of said disturbed line are separately and individually aligned with correctly received lines, comparing by correlating said shifted line with respect to at least one adjacent line and comparing the resulting correlation value with respect to a threshold value to determine said remaining portions, and correctly reproducing said disturbed line using said remaining portions and replaced portions taken from at least one adjacent line so that said reproduced line comprises the predetermined number of picture elements.

4,188,644

APPARATUS FOR CONTROLLING VIDEO TAPE PRESENTATION

Richard B. Thiewes, 132 S. Dakota Ave., Sioux Falls, S. Dak. 57101, and Donald W. Nelson, 8114 Portland Ave. S., Bloomington, Minn. 55420

Continuation of Ser. No. 753,834, Dec. 23, 1976, abandoned. This application Jul. 13, 1978, Ser. No. 924,445
Int. Cl.[2] G11B *27/02*
U.S. Cl. 360—14 **16 Claims**



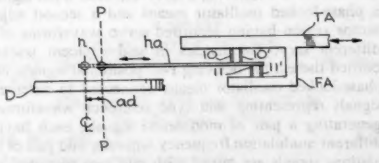
1. An apparatus for presenting a video tape deposition having audio and visual information to a court and jury comprising: a video tape unit adapted to be connected to a power supply, a jury monitor, a court monitor, each of said monitors having a viewing screen and means for audibly transmitting audio information, and means electrically coupling said monitors to the video tape unit whereby the audio and visual information on the video tape is simultaneously displayed on the jury and court monitors, said means electrically coupling said monitors to the video tape unit having an electrical audio circuit connecting the video tape unit with the court and jury monitors, an electrical video circuit connecting the video tape unit with the court and jury monitors, a first resistor interposed in the audio circuit, a second resistor interposed in the video circuit, and a two position switch means having a first position to couple the first and second resistors to the court and jury monitors to withhold the audio and visual information from the monitors while maintaining a power supply to the monitors, said first and second resistors providing impedance loads substantially the same as that of said monitors when said switch means is in the first position, whereby the monitors are in an operable power on condition when the switch means is in the first position, said switch means having a second position by-passing said first and second resistors whereby the electrical audio and video circuits function to simultaneously present audio and visual information on both monitors from said video tape unit to the court and jury.

4,188,645

PIEZOELECTRIC SERVO FOR DISK DRIVE

Herbert U. Ragle, Thousand Oaks, and Dean DeMoss, Camarillo, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Nov. 2, 1978, Ser. No. 957,169
Int. Cl.[2] G11B *21/02*
U.S. Cl. 360—75 **12 Claims**



1. In a recording transducer head supported upon a pre-

scribed mounting arm and adapted for relatively linear translation and fine-positioning of the head by servo translation means across a locus of medium-confrontation, the combination therewith of:

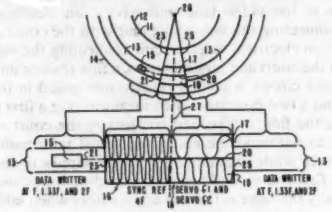
multi-part piezo-flexure means arranged to mount this arm for such translation and adapted to provide one pair of bi-part piezo-flexure strips arrayed in line and coupled directly to said arm pivotingly, as a pair of restraining cantilevers for assuring such linear translation upon electrical energization, each said strip comprising a piezo-flexure beam comprised of a pair of piezo crystal slabs bonded together and affixed about an intermediate electrode segment which contacts the elongate spaces thereof, with a like flanking electrode plate bonded on the respective outer face of each slab, opposite said intermediate electrodes; so that, upon application of prescribed signal voltages and associated field between said segment and said plates, the beams will be electro-strictively energized and distorted and caused to conjunctively convert said electro-strictive distortion into a prescribed bending and somewhat linear translation of the arm to said translation means.

4,188,646

SECTORIZED DATA PATH FOLLOWING SERVO SYSTEM

Frank J. Sordello, Los Gatos; Edward R. Darrah, San Jose, both of Calif., and James J. Touchton, Boulder, Colo., assignors to Sperry Rand Corporation, New York, N.Y.

Filed May 30, 1978, Ser. No. 910,257
Int. Cl.[2] G11B *21/10*
U.S. Cl. 360—77 **22 Claims**



1. In a data-path following servo system wherein fine lateral transducer position control is obtained by balancing two positional signals derived by combining two modulation frequencies with two different, recorded servo frequencies, the improvement comprising,

a data recording medium having a plurality of parallel servo tracks contained in spaced apart sectors interrupting user data path recording areas, said sectors having successive parallel servo tracks whereby a longitudinal boundary between two adjacent servo tracks projected outwardly from a sector defines the center line of a user data path, each of said servo tracks having header and tail regions, one following the other, in each sector, one of said sector regions having sync reference waveforms of a single selected frequency recorded therein in both of said adjacent servo tracks for deriving a sync reference input signal for a phase-locked oscillator means and a second adjacent sector region having recorded servo waveforms of two different servo frequencies in said adjacent tracks recorded therein for deriving two positional signals, and

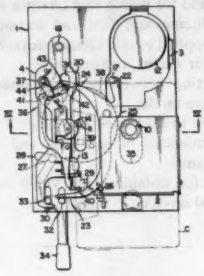
a phase-locked oscillator means connected to receive said signals representing said sync reference waveforms for generating a pair of modulation signals, each having a different modulation frequency whereby said pair of modulations signals are mixed with said two recorded servo frequencies obtaining two positional signals for balancing to correct lateral transducer position.

4,188,647

CASSETTE TYPE TAPE RECORDER

Shinsaku Tanaka, Tokyo, Japan, assignor to Tanashin Denki Co., Ltd., Tokyo, Japan

Filed May 12, 1978, Ser. No. 905,395
Claims priority, application Japan, May 27, 1977, 52-61871
Int. Cl.[2] G11B *15/24; G11B 21/22*
U.S. Cl. 360—105 **1 Claim**



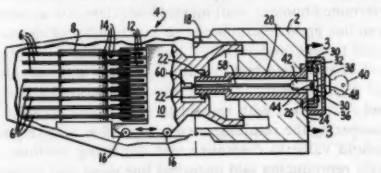
1. A cassette type recorder comprising a base board having a cam hole extending at a specific angle to a tape-running direction; a cassette-receiving section disposed on the base board, into which a cassette is inserted in a direction parallel to the direction in which the tape housed in it is to run; a drive mechanism including reel drive shafts, a capstan drive shaft and a motor for driving the reel and capstan drive shafts; a drive mechanism-carrying board supporting the drive mechanism and disposed below the base board and provided with a support pin protruding upwardly, said drive mechanism-carrying board moving upwardly and forwardly when a 2-reel cassette is inserted into the cassette-receiving section, in the direction in which the cassette moves, thereby inserting the reel and capstan drive shafts into the cassette; and a magnetic head-carrying board supporting a magnetic head and pinch roller and having on one end portion a cam pin inserted in the cam hole of the base board, said magnetic head-carrying board moving in unison with the drive mechanism-carrying board in the direction in which the cassette is inserted into the cassette-receiving section and rotating about said support pin as the cam pin moves in the cam hole, thereby gradually rotating the magnetic head and pinch rollers into contact with the tape in the cassette; as the drive mechanism carrying board is pivoted upwardly and the reel and capstan drive shafts contact the cassette reels and tape, respectively.

4,188,648

DATA SECURITY APPARATUS FOR MAGNETIC RECORDING DISC DRIVE

Albert J. Guerini, Gilroy, Calif., assignor to Memorex Corporation, Santa Clara, Calif.

Filed Sep. 5, 1978, Ser. No. 939,844
Int. Cl.[2] G11B *5/54*
U.S. Cl. 360—105 **8 Claims**



1. Apparatus for preventing unauthorized access to data recorded upon the magnetic discs of a disc drive which utilizes

at least one rotating magnetic disc and at least one magnetic playback head movable relative to the axis of rotation of the disc to access data recorded on the disc and a motor for moving the head relative to the disc axis, comprising

means selectively engageable and disengageable with said playback head for restraining, when engaged, the movement of said head, said head movement restraining means providing for restraint of said head movement independent of the operation of said head moving motor, and

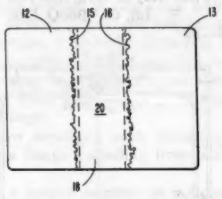
locking means for controlling the engagement and disengagement of said head movement restraining means such that said head movement restraining means can be disengaged only when said locking means is in an unlocked configuration, whereby control of the locking means serves to control access to the recorded data by controlling the movement of the playback head necessary to access the data.

4,188,649

MAGNETIC HEAD HAVING A JAGGED-EDGED GAP, AND METHOD FOR PRODUCING SUCH HEAD

Samuel D. Cheatham, Arvada; Neil L. Robinson, and Edmond W. Smathers, both of Boulder, all of Colo., assignors to IBM Corporation, Armonk, N.Y.

Filed Dec. 5, 1977, Ser. No. 857,500
Int. Cl.[2] G11B *5/25*
U.S. Cl. 360—118 **8 Claims**



1. A magnetic erase head for erasing magnetic information on a length of magentic media, the magnetic erase head comprising:

a first half core element of magnetic material and having defined thereon a first surface;

a second half core element of magnetic material and having defined thereon a second surface;

the first and second surfaces being positioned in an adjacent but spaced apart relationship to define a gap between the first and second half core members;

the first and second surfaces being irregular and jagged with a surface roughness greater than 0.5 microns at the portions thereof defining the gap; and

a non-magnetic material filling the gap;

whereby an erase head formed of surfaces initially of a relatively smooth configuration and thereafter made irregular and jagged with a surface roughness greater than 0.5 microns is provided to erase magnetic information from an adjacent moving magnetic media.

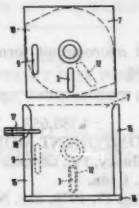
4,188,650

DISKETTE WITH ACCESS COVER MEANS

Wolf-Heider Rein, Pforzheim, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 6, 1978, Ser. No. 883,597
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1977, 2709944
Int. Cl.[2] G11B *23/02*
U.S. Cl. 360—133 **4 Claims**

1. A diskette comprising: a housing having approximately parallel side walls, each of said side walls having a first opening therethrough, said first openings being aligned; a pair of parallel auxiliary disks slidable inside said housing against respective ones of said housing side walls; means to hold said auxiliary disks in fixed positions relative to each other, each of said auxiliary disks having a second opening, said second openings always being aligned with each other, said auxiliary disks being slidable back and forth on said respective side walls between first and second positions, said first openings being completely



out of registration with said second openings when said auxiliary disks are in said first position, said first openings being at least in partial registration with said second openings when said auxiliary disks are in said second position; and a memory disk rotatable in between said auxiliary disks in frictional engagement therewith, the frictional force between said memory disk and said auxiliary disks being greater than that between said auxiliary disks and said housing sidewalls.

4,188,651

CERAMIC CAPACITOR WITH SURFACE ELECTRODES

John E. Dornfeld, and Bobby L. Joyner, both of Mequon, Wis., assignors to Sprague Electric Company, North Adams, Mass.

Filed Mar. 27, 1978, Ser. No. 890,343
Int. Cl.[2] H01G *1/005, 4/08*
U.S. Cl. 361—322 **7 Claims**

1. A capacitor comprising a semiconductive cylindrical body of reduced ceramic material, a plurality of closely-spaced, substantially parallel, interdigitated metal electrodes disposed on the cylindrical surface of said body, said body having a thin dielectric layer of an oxidized state of said ceramic material immediately beneath each of said electrodes, and a terminal disposed over each end of said cylindrical body, each said terminal in contact with at least one alternate of said interdigitated electrodes.

4,188,652

ELECTRONIC DEVICE

Gennady G. Smolko, 103482 korpus 501, kv. 19, Moscow, U.S.S.R.

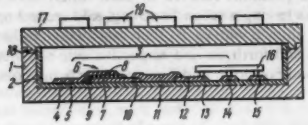
Filed Jan. 17, 1978, Ser. No. 870,174
Int. Cl.[2] H01L *19/00*
U.S. Cl. 361—402 **9 Claims**

1. An electronic device comprising:

a boxlike case made of a metal of the valve group and having an inner surface with a surface layer of the same metal;

a texturized anode oxide film formed in said surface of said

metal of said inner surface and obtained from said metal of said case; and



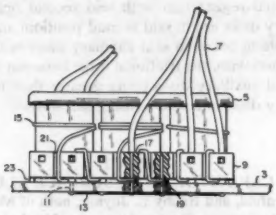
a film integrated microcircuit formed on said texturized anode oxide film.

4,188,653

ELECTRICAL COMPONENT MOUNTING PACKAGE

Charles A. Goepel, Muncy, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Aug. 17, 1978, Ser. No. 934,435
Int. Cl.[2] H05K 7/02
U.S. Cl. 361—405 **5 Claims**



1. In a mounting package including electrical wires and an electrical component with connecting wires and also including a printed circuit board having a plurality of spaced holes and an electrically conductive pattern and solder on one side of said board and an insulating frame member on the other side of said board with slots and selectively positioned apertures and connector pins aligned with said spaced holes of said printed circuit board, the improvement wherein said electrical wires pass through and extend from said apertures of said insulating frame member, said connecting wires of said electrical component pass through said slots and are affixed to said connector pins, and said electrical wires extending from said apertures and said connector pins pass through said spaced holes and are affixed to said electrically conductive pattern of said printed circuit board by said solder.

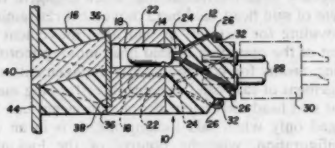
4,188,654

INCANDESCENT LAMPS/FIBER OPTIC COUPLED VERTICAL AND SCALE OR DISPLAY

Zygmund Reich, Burlington, and Raymond W. Sargent, Vergennes, both of Vt., assignors to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Filed Jul. 19, 1977, Ser. No. 817,460
Int. Cl.[2] G01K 1/06
U.S. Cl. 362—32 **5 Claims**

1. A display comprising;
an elongated insulating member,
an elongated heat sink member connected to said insulating member and having apertures in two parallel vertically extending rows therein with the apertures in each row in staggered relationship to one another;
incandescent lamps in each of said apertures having conductor means extending into said insulating member and connected to connectors extending from said insulating member;
an elongated module coextensive with said heat sink member and said insulating member;
said module having a plurality of plastic light pipes stacked on one another alternately in V-formation one end of each



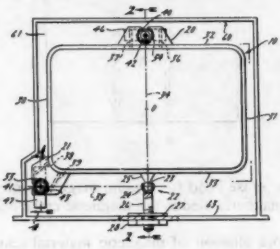
terminating alternatingly at a respective aperture in said two vertically extending rows in said heat sink member at said incandescent lamp and the other terminating in vertically extending lines forming a vertical array of dot positions to form a dot type array.

4,188,655

VEHICLE HEADLAMP AND MOUNTING ASSEMBLY

Thomas G. Tallon, Metamora, and Gerald A. Harris, Fraser, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed May 2, 1978, Ser. No. 902,125
Int. Cl.[2] B60Q 1/00
U.S. Cl. 362—80 **20 Claims**



1. A vehicle headlamp unit comprising a reflector and a lens attached to the reflector, said unit having three peripherally spaced mounting means projecting outwardly from its periphery and providing three suspension points from which it may be unyieldably positively secured and adjustably positioned relative to the vehicle from two of the points for independent rotative movement about a coplanar pair of orthogonal and intersecting axes, one of said axes contained in a longitudinal axial plane passing through the geometric center of the unit and the other of said axes displaced from the geometric center thereof,
a first and second one of said mounting means located opposite each other on the said one of said axes and the third mounting means located opposite said second mounting means and contained therewith on the other of said orthogonal axes,
said first and third mounting means adjustably connectable to the vehicle,
said second mounting means comprising one element of a rotary ball joint pivotal connection between the headlamp and the vehicle fixing the headlamp against linear translational movement relative to the vehicle and providing a common pivot rotationally translatable at the intersection of both of said axes for independent limited rotative movement of said lamp unit about the said other of said axes from linear translational adjustment movement of said first mounting means and about the said one of said axes from

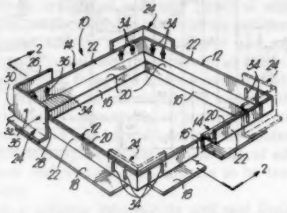
independent linear translational adjustment movement of said third mounting means.

4,188,656

LIGHT FRAME ADAPTER

Norman W. Howard, 3803 Brooklyn Crescent NW., Calgary, Alberta, Canada (T2L 1G9)

Filed Oct. 17, 1978, Ser. No. 952,156
Claims priority, application Canada, Jul. 17, 1978, 307538
Int. Cl.[2] F21S *3/06*
U.S. Cl. 362—365 **14 Claims**



1. An adapter for mounting a light fixture in a ceiling opening, comprising:

a plurality of frame members, one for each edge of said opening, each frame member having a first wall portion, a flange extending outwardly from one longitudinal edge of said first wall portion, a shoulder extending outwardly from the other longitudinal edge of said first wall portion and adapted to support a light fixture, and a second wall portion extending from the outer edge of said shoulder away from said flange;

a plurality of corner members, each having a generally planar wall and a flange extending from a lower edge thereof; and

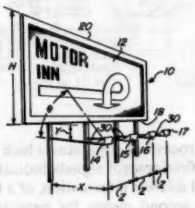
means connecting a corner member to a frame member adjacent each end thereof for transverse adjustment relative thereto, the adjacent flanges of each corner member and frame member defining a space therebetween for receiving a portion of said ceiling and clampingly engaging said portion.

4,188,657

REFLECTOR AND METHOD OF PRODUCING DIFFERENT, DISTINCTIVE AND PREDICTABLE LIGHT PATTERNS THEREFROM

Robert L. Reibling, Ft. Thomas, Ky., assignor to Whiteway Manufacturing Co., Inc., Cincinnati, Ohio

Continuation of Ser. No. 379,107, Jul. 13, 1973, abandoned. This application Dec. 19, 1975, Ser. No. 642,333
Int. Cl.[2] F21V *7/09*
U.S. Cl. 362—348 **19 Claims**



9. An assemblage for forming a plurality of different reflectors each of which produces a distinctive and predictable symmetric or asymmetric reflected light pattern, comprising:

a plurality of elongate, arcuately shaped reflector half-sections, said half-sections being identically shaped;

a plurality of reflecting surface finishes, each of said half-sections having one of said plurality of surface finishes thereon; and

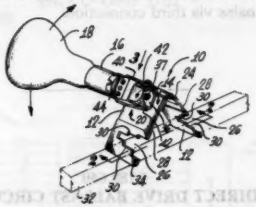
coupling means for coupling a selected pair of said plurality of reflector half-sections together to form an elongate symmetrically shaped reflector having a predetermined combination of surface finishes for producing a light beam having a width determined according to the combination of surface finishes on said coupled half-sections.

4,188,658

ADJUSTABLE SUPPORT FOR PORTABLE LAMP

Daniel L. Aron, Northridge, Calif., assignor to Mole-Richardson Co., Hollywood, Calif.

Filed Jul. 29, 1977, Ser. No. 820,087
Int. Cl.[2] F21V *21/00*; E04G *3/00*
U.S. Cl. 362—396 **4 Claims**



1. A portable lamp adapted for temporary connection to preexisting supporting members of various shapes and dimensions comprising:

a pair of brackets each having a notch with opposing step-shaped edges therein;

hinge means for connecting said brackets having a hinge axis extending generally parallel to the edges of each of said notches;

said step-shaped edges running substantially parallel to said hinge axis and defining a plurality of substantially rectangular adjoining areas having progressively smaller widths in going from the open ends of said notches to the closed ends thereof;

an electrical socket; and

means for connecting said socket to said brackets;

whereby a support member can be received by said notches and the angle between said brackets can be adjusted to cause the edges of a selected one of the rectangular areas of said notches to grip said supporting member.

4,188,659

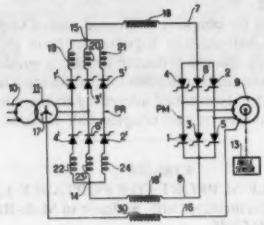
STATIC AC/AC THYRISTOR CONVERTER FOR A SELF-DRIVEN SYNCHRONOUS MOTOR

Michel Cailloux, Belfort, France, assignor to Ogee Alsthom, Levallois-Perret, France

Filed Mar. 22, 1978, Ser. No. 888,901
Claims priority, application France, Mar. 25, 1977, 77 08961
Int. Cl.[2] H02M *5/45*
U.S. Cl. 363—37 **4 Claims**

1. A static AC/AC thyristor converter comprising: a Graetz rectifier "machine" bridge for connection on its AC side to a variable-speed synchronous machine having a star-wound stator, and connected on its DC side via first and second conductors to a static AC/DC "mains" bridge converter for connection to three-phase AC mains, said bridges including respectively means for controlling the firing of their thyristors, said means for controlling the mains bridge converter including means for applying to said first and second conductors voltages whose polarities may be identical to each other or

opposite to each other, said AC/AC converter further including a third connection having a first end connected to the center of the star winding of the stator of the synchronous machine and having a second end connected to an AC point of



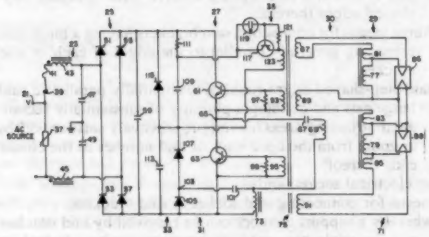
said mains bridge such that the current which flows in one or other of said first and second conductors when the polarities applied thereto in operation, are identical, returns to the three-phase AC mains via third connection.

4,188,660

DIRECT DRIVE BALLAST CIRCUIT

William C. Knoll, Turbotville, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed May 22, 1978, Ser. No. 908,044
Int. Cl.[2] H02M 5/293
U.S. Cl. 363—49 **19 Claims**



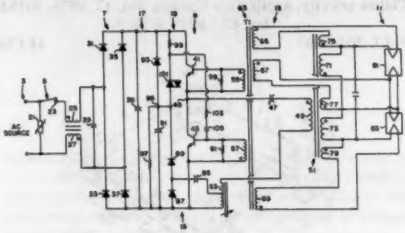
1. A direct drive electronic ballast circuit comprising:
an AC potential source;
rectifier circuit means coupled to said AC potential source for providing a pulsating DC potential;
high frequency inverter circuit means coupled to said rectifier circuit means;
a load circuit coupled to said high frequency inverter circuit;
high frequency inverter drive circuit means coupling said load circuit to said high frequency inverter circuit;
charge storage and isolating circuit means shunting said rectifier circuit means;
feedback rectifier means coupling said high frequency inverter circuit means to said charge storage and isolating circuit means; and
oscillator starting circuit means coupled to said charge storage and isolating circuit means and to said high frequency inverter drive circuit means whereby a potential developed at said charge storage and isolating circuit means activates said oscillator starting circuit which energizes said high frequency inverter circuit means.

4,188,661

DIRECT DRIVE BALLAST WITH STARTING CIRCUIT

Bruce L. Bower, Williamsport, and Raymond H. Kohler, Montoursville, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Feb. 23, 1979, Ser. No. 15,530
Int. Cl.[2] H02M 5/458; H05B 41/36
U.S. Cl. 363—49 **9 Claims**



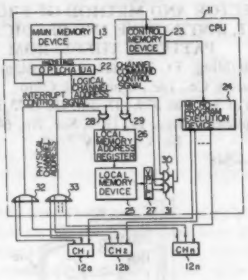
1. In a direct drive ballast circuit coupled to an AC potential source and having a rectifier circuit means providing a pulsating DC potential to a high frequency inverter circuit coupled to a load circuit with a high frequency inverter drive circuit coupling the load circuit to the high frequency inverter and a charge storage and isolating circuit shunting the rectifier circuit means and coupled to a feedback rectifier means connected to the high frequency inverter circuit means, the improvement comprising an oscilator starter circuit means directly coupled to said rectifier circuit means, said feedback rectifier circuit means, and to said charge storage and isolating circuit and AC coupled to said high frequency inverter circuit means.

4,188,662

ADDRESS CONVERTER IN A DATA PROCESSING APPARATUS

Masamichi Ishibashi, Tokyo, Japan, assignor to Fujitsu Limited, Japan

Filed Apr. 14, 1977, Ser. No. 787,493
Claims priority, application Japan, Apr. 27, 1976, 51-48259
Int. Cl.[2] G06F 9/20
U.S. Cl. 364—200 **8 Claims**



1. In a data processing apparatus which includes first means for generating first control signals indicating needed conversion, to physical address information, of a logical address to be translated, and second means for generating second control signals indicating needed conversion, to logical address information, of a physical address to be translated; a channel and input/output device address converter, comprising:
memory means for storing at least an address conversion table having address positions, each address position indi-

cating a respective logical address to be translated and a respective physical address to be translated, said memory means storing, at said each address position, at least one physical address information corresponding to said respective logical address to be translated indicated by said each address position and at least one logical address information corresponding to said respective physical address to be translated indicated by said each address position,

address gate means responsive to said first control signal and said second control signal, respectively, for enabling access of said address conversion table by said logical address to be translated and said physical address to be translated, respectively, at said address position indicating said logical address to be translated and said physical address to be translated, respectively, so as to cause simultaneous readout, from said address position indicating said logical address to be translated and said physical address to be translated, respectively, of both said physical address information and said logical address information stored at said address position indicating said logical address to be translated and said physical address to be translated, respectively,

said physical address information and said logical address information stored at said address position indicating said logical address to be translated and said physical address to be translated, respectively, thereby not corresponding to each other, but rather said physical address information stored at said address position being a translation of said logical address to be translated, and said logical address information stored at said address position being a translation of said physical address to be translated, and

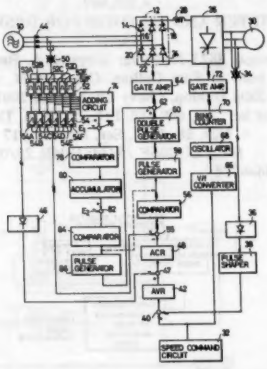
output gate means responsive to said first and second control signals for selecting, in accordance with said indicated needed conversion, one of said physical address information and said logical address information as simultaneously read out from said memory means.

4,188,663

PROTECTIVE DEVICE OF A CURRENT SOURCE INVERTER

Tadashi Okawa; Mitsuyuki Honbu, and Yasuo Matsuda, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 15, 1978, Ser. No. 877,982
Claims priority, application Japan, Feb. 16, 1977, 52-15027
Int. Cl.[2] H02M 7/00, 5/45
U.S. Cl. 363—51 **16 Claims**



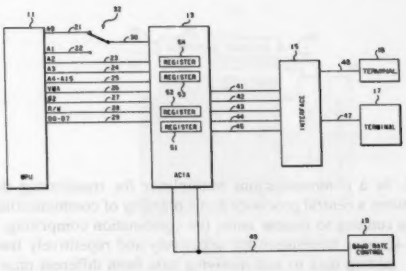
1. A protective device of a current source inverter comprising a converter which changes alternating current into direct current and which is made up of thyristors, an inverter which changes the d.c. output of said converter into alternating current, a reactor which is connected between said converter and said inverter, control circuitry which controls an output voltage of said converter and an output frequency of said inverter, a square wave generator which changes the alternating current into square waves corresponding to respective polarities of respective phases, an adding circuit which adds the square wave outputs of said square wave generator, a decision circuit which provides an output when an output of said adding circuit has become smaller than a predetermined value, and at least one thyristor which is rendered conductive in response to the output of said decision circuit and forms a circulating circuit for releasing energy stored in said reactor.

4,188,664

I/O TERMINAL IDENTIFICATION

Wallace E. DeShon, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 15, 1977, Ser. No. 851,650
Int. Cl.[2] G06F 3/02
U.S. Cl. 364—200 **9 Claims**



1. Apparatus comprising:

a computer means;

a first input/output (I/O) terminal means which requires a first data format;

a first interface means which interfaces said computer means to said first I/O terminal means;

a register means which is an integral part of said first interface means;

a switch having first and second positions;

means for supplying digital addresses from said computer means to said register means, at least a portion of said digital addresses being supplied from said computer means through said switch to said register means, the presence of said switch preventing at least one digit of the digital addresses supplied by said computer means from reaching said register means, so that a second digital address supplied by said computer means to said register means, as received by said register means, will be equivalent to a first digital address, as received by said register means, if said switch is in said first position and will not be equivalent to said first digital address, as received by said register means, if said switch is in said second position; and

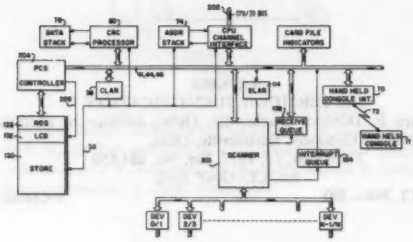
means for supplying digital data from said register means to said computer means when said first digital address is received by said register means or when said second digital address, as received by said register means, is equivalent to said first digital address, said computer means having means for introducing said first data format into said first interface means when said register means is enabled to supply the digital data stored in said register means to said computer means by said second digital address.

4,188,665

PROGRAMMABLE COMMUNICATIONS SUBSYSTEM

Dennis M. Nagel; Douglas O'Neal; Paul W. Petroskey; Jan W. van den Berg, all of Boca Raton; Donald V. Wildes, North Lauderdale, and David C. Wu, Delray Beach, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 29, 1977, Ser. No. 855,572
Int. Cl.[2] G06F 3/04
U.S. Cl. 364—200 3 Claims



1. In a communications multiplexer for transferring data between a central processor and a plurality of communications lines running to remote units, the combination comprising:

a scanner mechanism for selectively and repetitively transmitting data to and receiving data from different ones of the communications lines, each such communications line having a unique line address;

a storage mechanism having a separate data buffer for each communications line and a separate line control block for each communications line, each data buffer being located in its corresponding line control block;

a first-in-first-out transmit interrupt queue mechanism for receiving from the scanner mechanism the line addresses of those communications lines for which a processor-to-scanner data transfer operation is needed;

a line address register for receiving one line address at a time from the transmit queue mechanism and for supplying each such line address to the storage mechanism for addressing the corresponding line control block therein;

a controller mechanism responsive to an output of the transmit queue mechanism for performing during different time intervals the transfer of data between the central processor and any given data buffer and between the given data buffer and the scanner mechanism;

the controller mechanism including an interrupt mechanism responsive to the condition of the transmit queue mechanism when a valid line address appears at the output thereof for interrupting the controller mechanism and causing same to set such queue output line address into the line address register;

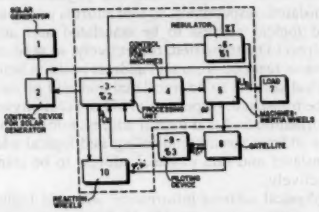
and the controller mechanism further including a first data transfer mechanism for transferring data from the central processor to the addressed line control block data buffer if such data buffer is empty and a second data transfer mechanism for transferring data from the addressed line control block data buffer to the scanner mechanism if such data buffer is not empty.

4,188,666

METHOD AND INTEGRATED SYSTEM FOR THE TORQUE CONTROL AND ENERGY STORAGE FOR A SPACE VEHICLE

Francis Legrand, Rocquencourt, and Bernard Weisser, Verneuil sur Seine, both of France, assignors to Societe Nationale Industrielle et Aerospatiale, Paris, France

Filed May 22, 1978, Ser. No. 908,598
Claims priority, application France, May 31, 1977, 77 16616
Int. Cl.[2] G06F 15/50; B64G 1/10
U.S. Cl. 364—434 12 Claims



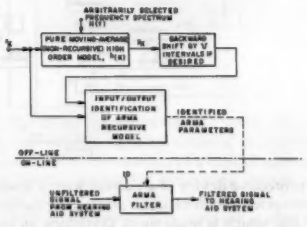
1. Method for the control and storage of energy for a space vehicle, notably for a satellite, having a piloting device, in which a busbar voltage available at a supply busbar is provided by a solar generator, and by a kinetic energy storage device including two momentum wheels in counter-rotation, said wheels serving also to create the torques necessary for piloting the satellite, said method comprising servo-coupling the momentum wheels to the busbar voltage through a first feedback loop including a regulator mounted between the supply busbar and a control device for the momentum wheels, so as to regulate the busbar voltage, servo-coupling the momentum wheels to the speed of the momentum wheels through a second feedback loop comprising a processing unit receiving signals representing said speed and connected to said control device for said wheels, so as to keep at a very low level the disturbing torques produced by the kinetic energy storage device, and servo-coupling the momentum wheels to the piloting device through a third feed-back loop comprising in series the piloting device, the processing unit and the momentum wheel control device, so as to supply the necessary torque for piloting.

4,188,667

ARMA FILTER AND METHOD FOR DESIGNING THE SAME

Daniel Graupe, 2821 Redwing; Aloysius A. Beex, 33-L Aggie Village, both of Fort Collins, Colo. 80521, and G. Donald Causey, 3504 Dunlop, Chevy Chase, Md. 20015

Division of Ser. No. 660,513, Feb. 23, 1976. This application Nov. 18, 1977, Ser. No. 852,917
Int. Cl.[2] G06F 15/34; H04R 25/00
U.S. Cl. 364—724 18 Claims


ARBITRARILY SELECTED FREQUENCY SPECTRUM
PURE MOVING-AVERAGE NON-RECURSIVE HIGH ORDER MODEL, h(z)
BACKWARD SHIFT BY V INTERVALS IF DESIRED
INPUT/OUTPUT IDENTIFICATION OF ARMA RECURSIVE MODEL
IDENTIFIED ARMA PARAMETERS
OFF-LINE
ON-LINE
UNFILTERED SIGNAL FROM HEARING AID SYSTEM
ARMA FILTER
FILTERED SIGNAL TO HEARING AID SYSTEM

1. A stable digital filter whose amplitude-frequency response approximates an arbitrarily selected frequency spectrum of

amplitude, whose total number of parameters m+n+1 is near-minimum, and whose phase response approximates a substantially linear function of frequency with an arbitrarily selected slope, comprising:

(a) an input terminal and output terminal;

(b) m+1 gain parameters $\beta_0, \beta_1, \ldots \beta_m$ associated with the input terminal;

(c) n gain parameters $\alpha_1, \alpha_2, \ldots \alpha_n$ associated with the output terminal;

(d) means connecting the input and output terminals with the gain parameters such that

$$\frac{y(t)}{u(t)} \quad \frac{\beta_0 + \beta_1 D + \ldots + \beta_m D^m}{1 + \alpha_1 D + \ldots + \alpha_n D^n}$$

where D is a delay operator operating on the filter's output and input signals y(t) and u(t), respectively, such that $Dy(t)=y(t-D)$, etc.;

(e) the gain parameters satisfying the relationship

$$\sum_{i=0}^{n} \alpha_i r_{k-i} = \sum_{j=0}^{m} \beta_j r_{k-j+v}$$

where n=0,1,2, . . . ; m=0,1,2, . . . ; k is an integer; v is an integer determining the slope of the phase shift versus frequency response of the filter; and y_k and r_k are the kth elements of an output sequence and a random sequence, respectively, the output sequence being the sequence obtained by convolving a truncated sequence of coefficients with the random sequence, the truncated sequence being a sequence obtained by truncating the sequence of coefficients resulting from performing an inverse Fourier transform on said arbitrarily selected frequency spectrum.

4,188,668

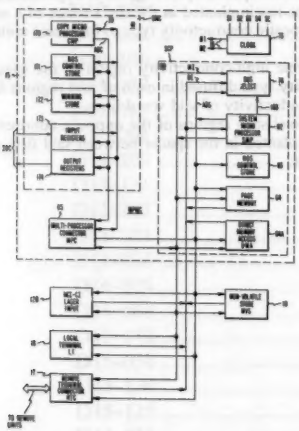
COMPUTER-CONTROLLED COPIER-PRINTERS

David E. Finlay, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 729,451, Oct. 4, 1976. This application Nov. 16, 1977, Ser. No. 851,903

Int. Cl.[2] G03G *15/00*; G06F *15/16*

U.S. Cl. 364—900 **5 Claims**



1. A copy production machine having a copy production portion, first and second input means for supplying images to said copy production portion to be imposed on copy sheets, electrical image signal input means for supplying image indicating signals, comprising, in combination:

first programmable computer means for coupling said electrical image signal input means to said second input means to provide text processing of said image indicating signals prior to their being supplied to said second input means,

second programmable computer means coupled to said copy production portion for controlling the sequence of operations to produce copies of images from either of said first and second input means, and

multiprocessor connector means for coupling said first programmable computer means to said second programmable computer means whereby said first programmable computer means can send operating instructions and parameters to said second programmable computer means to modify the control of said copy production portion.

4,188,669

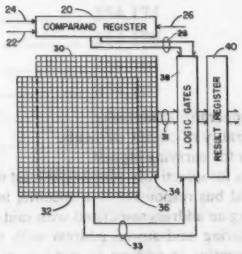
DECODER FOR VARIABLE-LENGTH CODES

Tomlinson G. Rauscher, Wayland, Mass., assignor to NCR Corporation, Dayton, Ohio

Filed Jan. 13, 1978, Ser. No. 869,961

Int. Cl.[2] G06F *7/02*

U.S. Cl. 364—900 **18 Claims**



1. Apparatus for decoding an inputted variable-length code word comprising:

a first memory unit having stored therein a plurality of variable-length code words of a coded system, each code word being stored at a predetermined location in said memory unit which location represents the decoded information corresponding to the stored variable-length code word;

a second memory unit having stored therein a length-indicating word for each variable-length word stored in said first memory unit;

first storage means for storing the inputted variable-length code word;

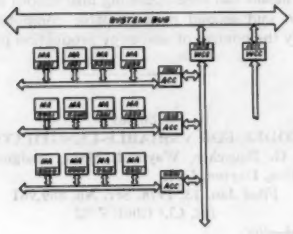
logic means connected to said first storage means and said first and second memory units for comparing the inputted variable-length code word stored in said first storage means with each variable-length code word stored in said first memory unit and for sensing the associated length-indicating word in said second memory unit to output a signal upon finding a coincidence with one of said variable-length code words stored in said first memory unit and the presence of its associated length-indicating word stored in said second memory unit;

and second storage means connected to said logic means for storing said signal in a location in said second storage means in accordance with the location in said first memory unit of said one of said variable-length code words which location in said second storage means represents the decoded information corresponding to the inputted variable-length code word.

4,188,670
ASSOCIATIVE INTERCONNECTION CIRCUIT

Yukun Hsia, Santa Ana, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Jan. 11, 1978, Ser. No. 868,667
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—49 10 Claims



1. An apparatus comprising:

a. a plurality of circuit elements,

b. a bus for carrying signals,

c. means for selectively coupling at least one of said elements to said bus responsive to a specific, including means for storing an address associated with said element, means for comparing said stored address with said specific signal representing an address on said bus, means for generating an enable signal indicative of the result of comparison, and means for enabling said element to communicate with said bus with responsive to said enable signal when the result of said comparison is the identity of said stored address and said address represented by said specific signal, and

d. means for controlling said selective coupling means to respond to a selectable specific signal, including

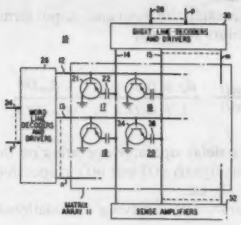
means for erasing said stored address associated with said element, and

means for initiating storage of another address in said address storing means, whereby said stored address associated with said element may be altered.

4,188,671
SWITCHED-CAPACITOR MEMORY

Dennis J. Lynes, Madison, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 761,806, Jan. 24, 1977, abandoned. This application Nov. 7, 1978, Ser. No. 959,207
Int. Cl.[2] G11C *11/24*
U.S. Cl. 365—149 7 Claims



1. In combination in an LSI random-access-memory unit designed to store multiple information words,

means forming multiple spaced-apart word lines,

means orthogonally disposed with respect to said word lines forming multiple spaced-apart digit lines,

multiple identical memory cells respectively connected at the multiple intersections defined by said orthogonally disposed word and digit lines,

each cell at an intersection comprising

a single transistor having base, emitter and collector electrodes,

and a single capacitor,

said base electrode being directly connected to the word line defining said intersection, one of said collector and emitter electrodes being connected to a point of reference potential, and the other one of said collector and emitter electrodes being connected via said capacitor to the digit line defining said intersection,

and means connected to said word and digit lines for selecting a particular one of said memory cells during writing and reading operations,

wherein said first-mentioned means comprises

plural parallel spaced-apart regions of a specified conductivity type ion implanted in the top surface of a substrate of the opposite conductivity type to form said multiple word lines,

at least one high-conductivity region of the specified conductivity type diffused in each of said regions to enhance the conductivity of said word lines,

and channel stop regions of the opposite conductivity type ion implanted in the spaces between said first-mentioned regions.

DESIGN PATENTS

GRANTED FEB. 12, 1980

ERRATA

For CLASS	See PATENT NO.
D01-003	254,159
D02-270	254,175
D02-270	254,176
D02-270	254,177
D02-427	254,179
D03-071	254,157
D04-015	254,162
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D06-049	254,172
D06-029	254,174
D06-236	254,178
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D08-071	254,167
D08-354	254,168
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D09-052	254,163
D10-106	254,183
D10-057	254,189
D10-106	254,197
D11-127	254,190
D11-152	254,194
D11-004	254,198
D12-203	254,191
D12-131	254,192
D12-203	254,193
D13-021	254,186
D14-036	254,183
D14-006	254,185
D14-060	254,200
D15-112	254,184
D15-036	254,187
D15-130	254,196
D15-125	254,199
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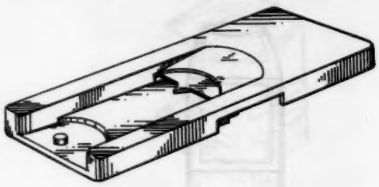
D18-012	254,195

D20–010 254,203
D21–225 254,201
D21–027 254,202
D21–237 254,204
D21–185 254,205
D21–212 254,210
D21–234 254,211
D21–234 254,212
D23–146 254,207
D24–038 254,206
D24–064 254,214
D28–065 254,208
D28–049 254,209
D48–023 R 254,215

FEBRUARY 12, 1980

254,156
VIAL CAP OPENER
Peter Swartz, 33 Pine Ave., Randolph, Mass. 02368, and Ronald J. Sostek, 51 Ansie Rd., Chelmsford, Mass. 01824
Filed Jun. 14, 1978, Ser. No. 916,004
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—40



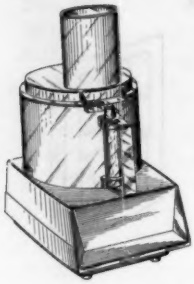
254,157
LUGGAGE
Joseph Y. Pelavin, North Bergen, N.J., assignor to Lark Luggage Corporation
Filed Jun. 20, 1978, Ser. No. 917,434
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71

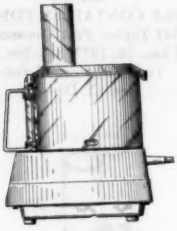
254,158
RECESSED READING MATERIAL SUPPORT
Virgil R. Caudill, Rte. 2, Indian Lake Camp, Vicksburg, Mich. 49097
Filed Aug. 9, 1978, Ser. No. 932,412
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—130

254,159
EDIBLE CONTAINER FOR FOOD
Gordon Daline, 1041 Taylor, Port Townsend, Wash. 98368
Filed Jan. 24, 1977, Ser. No. 755,785
Term of patent 14 years
Int. Cl. D1—*01*
U.S. Cl. D1—3

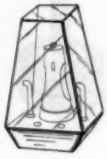
254,160
COMBINED ROPE AND TERMINAL UNIT THEREFOR
Frank D. Bruner, 10012 Emmet St., Omaha, Nebr. 68134
Filed Jan. 31, 1977, Ser. No. 763,784
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—349

254,161
MACHINE FOR PROCESSING FOOD
Pierre Verdun, Fontsnay-sous-Bois, France, assignor to Robot Coupe, S.A., Rosny sous Bois, France
Filed Jan. 31, 1977, Ser. No. 763,800
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—153

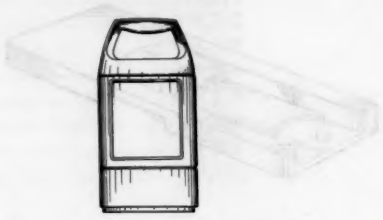




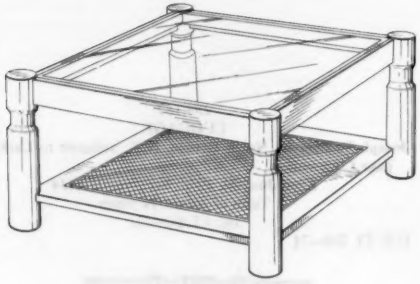
254,162
COMBINED TOOTHBRUSH, DISPLAY AND CHARGING UNIT THEREFOR
Fred J. Barker, 415 N. Hutchinson St., Adel, Ga. 31620
Filed Apr. 18, 1977, Ser. No. 788,680
Term of patent 14 years
Int. Cl. D4—*02*; D24—*03*
U.S. Cl. D4—15

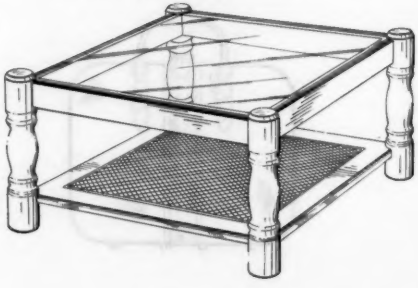


254,163
CONTAINER FOR LIQUIDS OR THE LIKE
William E. Sidor, Jenison, Mich., assignor to Leigh Products, Inc., Coopersville, Mich.
Filed May 23, 1977, Ser. No. 799,757
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—52

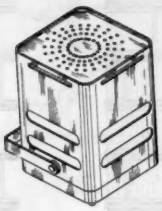


254,164
TABLE
Sidney Gibson, 229 Deloraine Ave., Toronto, Ontario, Canada (M5M 2B2)
Filed Jun. 20, 1977, Ser. No. 808,254
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—175

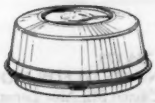


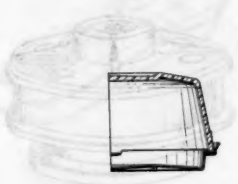


254,165
PORTABLE STOVE
Allen G. Woodward, Rte. 3, Princeton, Minn. 55371
Filed Jul. 18, 1977, Ser. No. 817,002
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—110



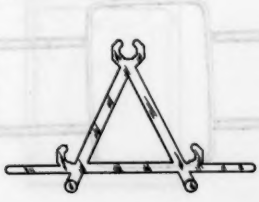
254,166
FOOD STORAGE CONTAINER
Hubert E. Christian, Phoenix, Ariz., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Jul. 27, 1977, Ser. No. 819,655
Term of patent 14 years
Int. Cl. D7—*01, 07*
U.S. Cl. D7—76



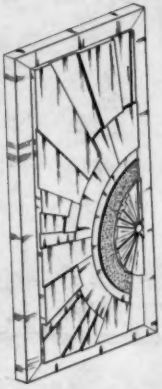


254,167
ARC WELDING ELECTRODE HOLDER
Charles G. Matthews, 1649 Semmes St., Memphis, Tenn. 38114
Filed Jul. 28, 1977, Ser. No. 819,775
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—71

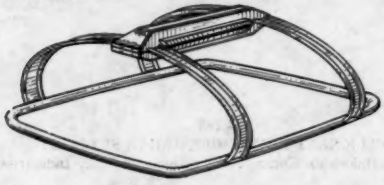
254,168
CATTLE SLAT REINFORCING BAR SUPPORT
Robert J. Ilukowicz, Coram, N.Y., assignor to Preco Industries Ltd.
Filed Aug. 15, 1977, Ser. No. 824,408
Term of patent 3½ years
Int. Cl. D8—*08*
U.S. Cl. D8—354

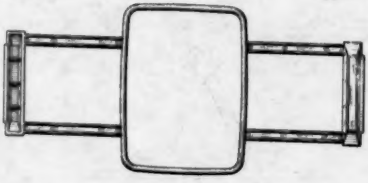


254,169
CABINET DOOR
Glenn Knight, Rochester, N.Y., assignor to Portrait Kitchens, Inc., Rochester, N.Y.
Filed Aug. 22, 1977, Ser. No. 826,882
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—192

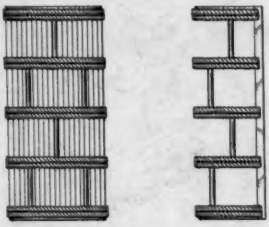


254,170
COMBINED REMOVABLE CARRYING HANDLE AND FRAME FOR A FOOD STORAGE CONTAINER
Jack V. Croyle, Woonsocket, and Robert F. Bateman, Greenville, both of R.I., assignors to Dart Industries Inc., Los Angeles, Calif.
Filed Aug. 25, 1977, Ser. No. 827,647
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—132



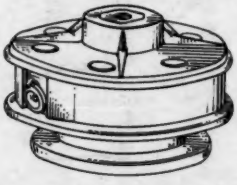


254,171
BOOKCASE OR THE LIKE
Gregory L. Simmons, 7863 Denham Rd. E., Jacksonville, Fla. 32208
Filed Aug. 29, 1977, Ser. No. 828,552
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—186

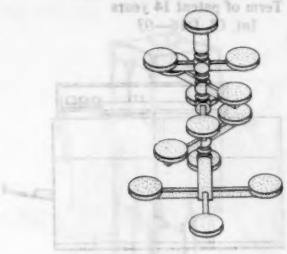


254,172
UPHOLSTERED ROCKING CHAIR OR THE LIKE
Gregory L. Simmons, 7863 Denham Rd. E., Jacksonville, Fla. 32208
Filed Aug. 29, 1977, Ser. No. 828,555
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—49

254,173
ROTARY CUTTING HEAD FOR MOWER
Raymond E. Proulx, 5837 Cameo St., Alta Loma, Calif. 91701
Filed Nov. 7, 1977, Ser. No. 849,456
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—8



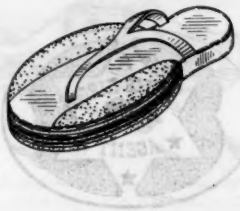
254,174
DISPLAY STAND OR SIMILAR ARTICLE
Henry Horback, 14195 Westmore, Livonia, Mich. 48154
Filed Dec. 5, 1977, Ser. No. 857,874
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—29



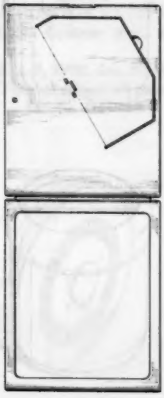
254,175
SANDAL
Gary V. Corcoran, Box 340, Naselle, Wash. 98638, and John R. Reed, 101 SE. 88th Ave., Vancouver, Wash. 98664
Filed Dec. 7, 1977, Ser. No. 858,282
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—270

254,176
SANDAL
Gary V. Corcoran, Box 340, Naselle, Wash. 98638, and John R. Reed, 101 SE. 88th Ave., Vancouver, Wash. 98664
Filed Dec. 7, 1977, Ser. No. 858,283
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—270

254,177
SANDAL
Gary V. Corcoran, Box 340, Naselle, Wash. 98638, and John R. Reed, 101 SE. 88th Ave., Vancouver, Wash. 98664
Filed Dec. 7, 1977, Ser. No. 858,300
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—270

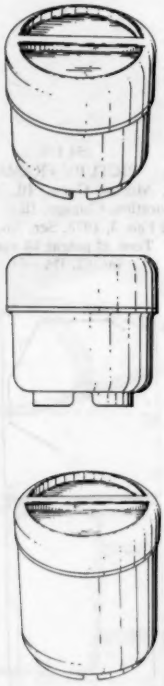


254,178
PICTURE FRAME
Norris B. Levine, Morton Grove, Ill., assignor to Intercraft Industries Corporation, Chicago, Ill.
Filed Feb. 3, 1978, Ser. No. 874,922
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—236

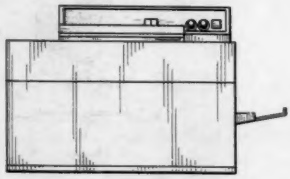


254,179
BELT BUCKLE
Michael Dolas, Santa Barbara, Calif., assignor to Wells Fargo & Company, San Francisco, Calif.
Filed Mar. 31, 1978, Ser. No. 893,162
Term of patent 14 years
Int. Cl. D02—*07*
U.S. Cl. D2—427

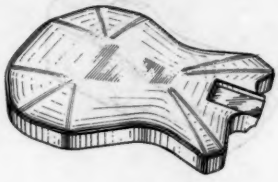
254,180
CANISTER OR THE LIKE
Andre Morin, 59 Place Mansfield, Dollard des Ormeaux, Quebec, Canada
Filed Apr. 20, 1978, Ser. No. 898,509
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—79



254,181
COPYING MACHINE
Toshihiko Sakow, Teaneck, N.J.; Isao Katayama, Kobe, and Sadao Ishihara, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Oct. 29, 1976, Ser. No. 736,977
Claims priority, application Japan, Apr. 30, 1976, 51-16338; Apr. 30, 1976, 51-16339; Apr. 30, 1976, 51-16340
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—31



254,182
GUITAR BODY OR THE LIKE
Emil H. Soika, 2312 E. Grand Ave., Lindenhurst, Ill. 60046, and Robert R. Genc, 117 E. Grove, Mundelein, Ill. 60060
Filed Jun. 20, 1977, Ser. No. 808,232
Term of patent 7 years
Int. Cl. D17—*03*
U.S. Cl. D17—20



254,183
HEAD-PHONE
Peter J. Doodson, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jul. 7, 1977, Ser. No. 813,753
Claims priority, application Benelux, Jan. 11, 1977, 5158800
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—36

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254,184

BEVERAGE DISPENSING MACHINE

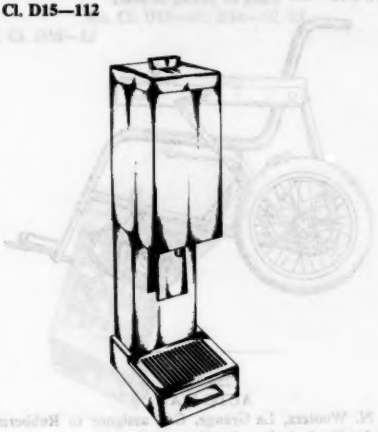
Ernest N. Martin, Escondido, and Michael D. Munson, Jurupa, both of Calif., assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Jul. 11, 1977, Ser. No. 814,780

Term of patent 14 years

Int. Cl. D15—*08*

U.S. Cl. D15—112



254,185

DICTATING MACHINE

Peter J. Doodson, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

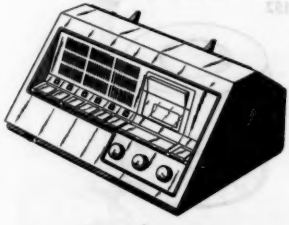
Filed Sep. 26, 1977, Ser. No. 836,683

Claims priority, application Benelux, Mar. 30, 1977, 5177400

Term of patent 14 years

Int. Cl. D14—*01*

U.S. Cl. D14—6



1

254,186

RESISTOR HOUSING

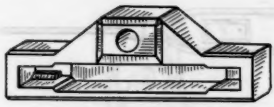
Anthony Collett, Mendham Township, Morris County, N.J., assignor to The Colber Corporation, Irvington, N.J.

Filed Sep. 29, 1977, Ser. No. 838,114

Term of patent 14 years

Int. Cl. D13—*03*

U.S. Cl. D13—21



254,187

DISHWASHER BASKET

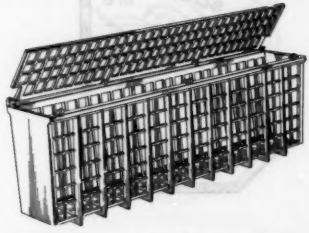
Lillian M. Freese, San Marino, Calif., assignor to Freese Products Corporation, San Marino, Calif.

Filed Nov. 2, 1977, Ser. No. 848,022

Term of patent 14 years

Int. Cl. D15—*05*; D9—*04*

U.S. Cl. D15—36



254,188

COMBUSTION DETECTOR

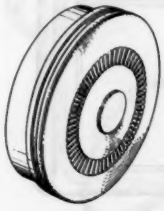
James A. Odom, 14540 Genesee Ave., Apple Valley, Minn. 55124

Filed Jan. 3, 1978, Ser. No. 866,316

Term of patent 14 years

Int. Cl. D10—*05*

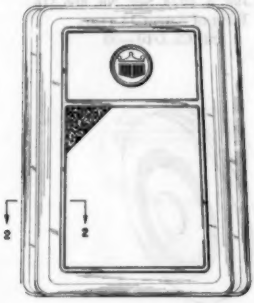
U.S. Cl. D10—106



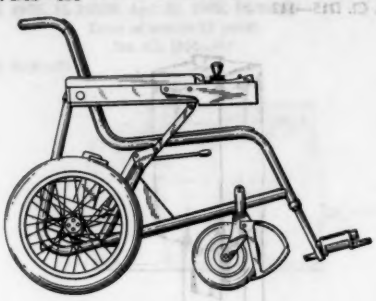
254,189
DIGITAL THERMOMETER
Howard S. Prosky, Denver, Colo., assignor to Electromedics, Inc., Denver, Colo.
Filed Jan. 5, 1978, Ser. No. 867,358
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—57

254,190
CHRISTMAS ORNAMENT
William B. Campbell, deceased, late of Saint Paul, Minn., by Doris Campbell, executor, West St. Paul, Minn., assignors to Ball Corporation, Muncie, Ind.
Filed Jan. 17, 1978, Ser. No. 870,258
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—127

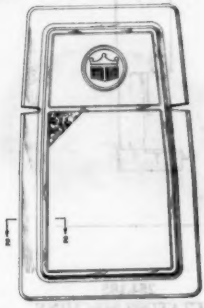
254,191
AUTO MAT
Dwight N. Wooters, La Grange, Ga., assignor to Rubbermaid Specialty Products Inc., La Grange, Ga.
Filed Feb. 1, 1978, Ser. No. 874,273
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—203



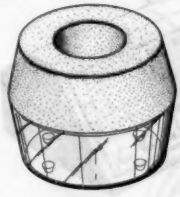
254,192
WHEELCHAIR
Hiroshi Honzyou, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Feb. 13, 1978, Ser. No. 877,360
Term of patent 14 years
Int. Cl. D12—*12*
U.S. Cl. D12—131



254,193
AUTO MAT
Dwight N. Wooters, La Grange, Ga., assignor to Rubbermaid Specialty Products Inc., La Grange, Ga.
Filed Mar. 2, 1978, Ser. No. 883,037
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—203



254,194
PLANT HOLDER
Walton J. Smith, Rte. 4, Grafton, N.H. 03240
Filed Mar. 13, 1978, Ser. No. 886,294
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—152



254,195

SLIDING HIDEAWAY KEYBOARD

Donald M. Genaro, Haworth; Rembert R. Stokes, Middletown, both of N.J., and Gordon E. Sylvester, Jamaica, N.Y., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 23, 1978, Ser. No. 889,604
Term of patent 14 years
Int. Cl. D18—*01*; D14—*02, 03*
U.S. Cl. D18—12

254,196

PORTABLE MANDREL

Michael H. Shulman, 45 Bruce Farm Dr., Willowdale, Ontario, Canada

Filed Apr. 24, 1978, Ser. No. 899,349
Term of patent 3½ years
Int. Cl. D15—*09*; D8—*05*
U.S. Cl. D15—130

254,197

INTRUSION ALARM HOUSING

Douglas K. Ewald, Greeley, Colo., assignor to Teledyne Industries, Inc., Ft. Collins, Colo.

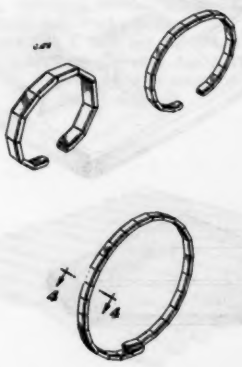
Filed Apr. 28, 1978, Ser. No. 900,928
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106

254,198

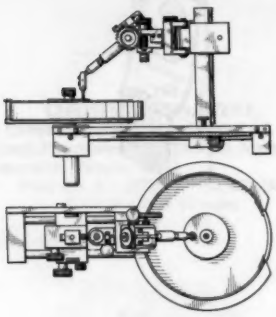
SEGMENTAL JEWELRY BAND

Gilbert F. Hardy, Huntington Beach, Calif., assignor to Deana W. Wyrwa, Santa Ana, Calif.

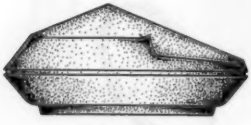
Filed Jul. 24, 1978, Ser. No. 927,684
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—4



254,199
STONE FACETING MACHINE
Louis M. Beeman, 19120 Nordhoff #46, Northridge, Calif. 91324
Filed Sep. 14, 1978, Ser. No. 944,689
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—125

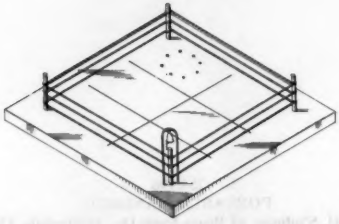


254,200
TELEPHONE STAND
George M. Janda, Westchester, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.
Filed Dec. 21, 1978, Ser. No. 971,990
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—60

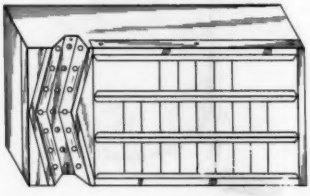


254,201
SKATE
Ian F. Norton, 272 St. Clements Ave., Toronto, Ontario, Canada, and Gerald Beekenkamp, Unit 62, 617 Rathburn Rd., Etobicoke, Ontario, Canada (M9C 3T5)
Filed Jul. 6, 1976, Ser. No. 702,412
Claims priority, application Canada, May 31, 1976, 310576
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—225

254,202
BOXING GAME BOARD
Zoltan Kasas, 419 River Dr., Garfield, N.J. 07026, and Akos Nagy, 109 Aycrigg Ave., Passaic, N.J. 07055
Filed Mar. 25, 1977, Ser. No. 781,369
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—27



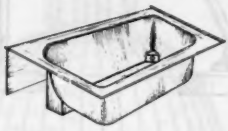
254,203
ILLUMINATED SIGN WITH CHANNELS FOR MOVEABLE CHARACTER PLATES
Ralph Kutschmende, 395 Manhattan Ave., Brooklyn, N.Y. 11211
Filed Jun. 8, 1977, Ser. No. 804,550
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—10

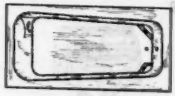


254,204
LIFE PRESERVER
Rolf A. Samsing, 349 Elm St., Braintree, Mass. 02184
Filed Aug. 15, 1977, Ser. No. 824,647
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D21—237

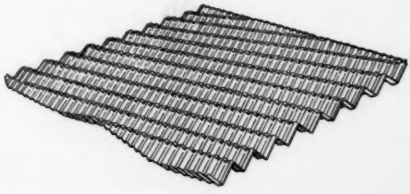
254,205
DOLL OR SIMILAR ARTICLE
Bob Boston, Jr., 2151 Godwin SE., Grand Rapids, Mich. 49503, and Patricia Mills, 4139 Oak Park SE., Kentwood, Mich. 49508
Filed Aug. 22, 1977, Ser. No. 826,340
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—185

254,206
WHIRLPOOL BATHTUB
Philip I. Ogden, P.O. Box 7671, Boise, Id. 83707
Filed Sep. 12, 1977, Ser. No. 832,544
Term of patent 14 years
Int. Cl. D24—*02*; D23—*02*
U.S. Cl. D24—38

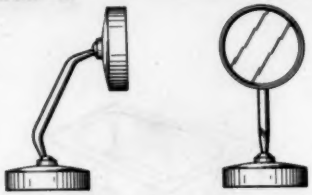




254,207
CORRUGATED METAL SHEET CONTACT BODY FOR HUMIDIFIERS
Roy Holmberg, Jonkoping, Sweden, assignor to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden
Filed Oct. 3, 1977, Ser. No. 838,551
Claims priority, application Sweden, Apr. 1, 1977, 77-0752
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—146

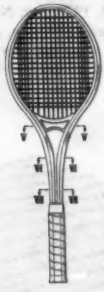


254,208
MAKE-UP MIRROR
David Breslow, 15 W. 26 St., New York, N.Y. 10010
Filed Dec. 9, 1977, Ser. No. 859,654
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—65



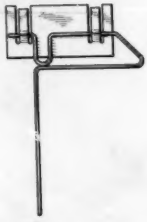
254,209
ELECTRIC SHAVER
Norman A. Steinkamp, La Grange Park, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Filed Jan. 16, 1978, Ser. No. 869,565
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—49

254,210
TENNIS RACKET
Minoru Yoneyama, Koshiji, Japan, assignor to Yonex Sports Kabushiki Kaisha, Koshiju, Japan
Filed Feb. 7, 1978, Ser. No. 875,878
Claims priority, application Japan, Aug. 8, 1977, 52-31230
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—212

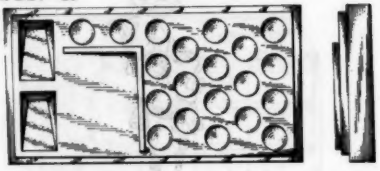


254,211
GOLFER'S TOOL
William L. Gutknecht, 755 Taft, Apt. K, Arlington, Tex. 76011
Filed Apr. 10, 1978, Ser. No. 895,291
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—234

254,212
VISUAL AID FOR GOLF SWING
Benson A. Jones, 6501 Vista Del Mar, Playa del Rey, Calif. 90201
Filed Apr. 10, 1978, Ser. No. 895,292
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—234



254,213
COMBINED MIXING AND STAINING DENTAL SLAB
Gayland G. Bird, 4810 SW. 6th St., Miami, Fla. 33134
Filed Sep. 18, 1978, Ser. No. 942,980
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—10

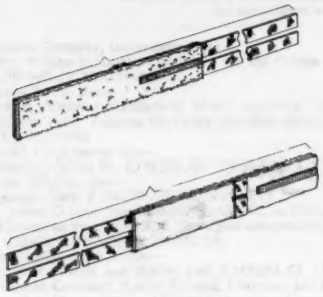


254,214

LIMB AND/OR BODY RESTRAINT

Dennis J. Leary, 3104 Bagley Ave., Los Angeles, Calif. 90034

Filed Dec. 18, 1978, Ser. No. 970,202
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—64



254,215

LUMINAIRE

Theodor G. Yahraus, and Russell C. Dahl, both of Crawfordsville, Ind., assignors to National Service Industries, Inc.

Filed Dec. 2, 1977, Ser. No. 856,793
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—23 R

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 12TH DAY OF FEBRUARY, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. H. Robins Company, Incorporated: *See*—
Melby, William E.; Isdale, Charles E., Sr.; and Collins, Vernon K., 4,188,467, Cl. 435-274.000.

A. Menarini S.A.S.: *See*—
Pestellini, Vittorio; Ghelardoni, Mario; Bianchini, Claudio; Del Soldato, Piero; Volterra, Giovanna; and Meli, Alberto, 4,188,323, Cl. 548-229.000.

A. O. Smith Corporation: *See*—
Wheaton, William H., 4,188,553, Cl. 310-68.00C.

A/S Hoyer-Ellefsen: *See*—
Vigander, Kjell, 4,188,157, Cl. 405-210.000.

Aalbers, Johan G.; and Van Paassen, Nicolaas I., to Chem-Y, Fabriek Van Chemische Produkten B.V. Detergent compositions containing ether sulfates. 4,188,311, Cl. 252-551.000.

AB Svenska Flaktfabriken: *See*—
Fermer, Karl-Erik; and Hulthe, Leif, 4,187,879, Cl. 137-601.000.

Abbes, Claude; Gournier, Andre; Rouaud, Christian; and de Villepoix, Raymond, to Commissariat a l'Energie Atomique. Composite flexible joint. 4,188,037, Cl. 277-2.000.

Abbey, Harold G. Fuel-air ratio controlled carburetion system. 4,187,805, Cl. 123-28.000.

Abbott Laboratories: *See*—
Bujan, Albert F., 4,187,893, Cl. 150-8.000.
Mitscher, Lester A.; Clark, George W., III; and Bokelman, Gordon H., 4,188,329, Cl. 260-343.30P.
Pernet, Andre G.; Nakamoto, Hiromasa; and Ishizuka, Naoyasu, 4,188,331, Cl. 260-343.600.
Tadanier, John S.; Martin, Jerry R.; and Kurath, Paul, 4,188,319, Cl. 260-112.50R.

Abcor, Inc.: *See*—
Nuwayser, Elie S.; and Barrington, James E., 4,187,839, Cl. 128-79.000.

Abelentseva, Galina M.: *See*—
Melnikov, Nikolai N.; Grapov, Artur F.; Razvodovskaya, Ljudmila V.; Popov, Petr V.; Sedykh, Aelita S.; Shapovalova, Galina K.; Abelentseva, Galina M.; Siforova, Tamara A.; Nikolaeva, Tatyana A.; Galitsina, Valentina V.; Stonov, Leonid D.; and Bakumenko, Ljudmila A., 4,188,382, Cl. 424-200.000.

Abell, Gary E., to Babcock & Wilcox Company, The. Apparatus for aligning an inspection or repair device with a selected tube in a heat exchanger. 4,188,167, Cl. 414-744.000.

Abex Corporation: *See*—
King, Donald A., 4,187,958, Cl. 222-57.000.

Abiru, Hisanori; Nakao, Yoshiaki; Imamura, Yoshiaki; and Sada, Hidetaka, to Mitsubishi Jukogyo Kabushiki Kaisha. Tracer head. 4,187,614, Cl. 33-174.00L.

ACF Industries, Incorporated: *See*—
Alvarez, Patricio D., 4,188,014, Cl. 251-196.000.
Kull, George A., 4,187,881, Cl. 137-625.310.
Phelan, Michael B.; and White, Jack M., 4,187,814, Cl. 123-119.0EC.
Whaley, William L., 4,188,016, Cl. 251-328.000.

Achard, Michel, to Automobiles Peugeot. Control of an automatic gearbox in an automobile. 4,187,742, Cl. 74-863.000.

Acieries Reunies de Burbach-Eich-Dudelange S.A. ARBED: *See*—
Herrig, Klaus; and Wagner, Heinz, 4,188,020, Cl. 256-45.000.

ACR Electronics, Inc.: *See*—
Hahn, James H., 4,188,556, Cl. 310-268.000.

Adachi, Shigeo: *See*—
Takagi, Izumi; and Adachi, Shigeo, 4,187,732, Cl. 74-230.17M.

Adams, Clyde M., Jr. Aluminum production. 4,188,207, Cl. 75-68.00B.

Adams, Paul G.; and Gebler, Kenneth A., to Nalco Chemical Company. Sprayable material for repairing base plates of ingot molds. 4,188,416, Cl. 427-135.000.

Adams, Robert G.; Pouli, Dirk; Ridgley, Dana H.; and Stephens, Donald E., to Hooker Chemicals & Plastics Corp. Bipolar electrode with intermediate graphite layer and polymeric layers. 4,188,464, Cl. 429-210.000.

Adrian, Linda S.: *See*—
Dempsey, Leonard H.; and Adrian, Linda S., 4,188,034, Cl. 273-248.000.

AGA Aktiebolag: *See*—
Rudolphi, Kjell, 4,187,868, Cl. 134-184.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Barge, Jean; Catte, Raymond; Chapelet, Gilbert; Bui, Ai; Dejean, Pierre; Huraux, Claude; and Mayoux, Christian, 4,188,303, Cl. 252-63.700.
Duguet, Jean-Claude, 4,188,131, Cl. 366-301.000.

Agency of Industrial Science & Technology: *See*—
Fujii, Kinjiro; Kondo, Wakichi; and Kumagai, Toshiya, 4,188,370, Cl. 423-579.000.

Aisan Industry Co., Ltd.: *See*—
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, 4,187,816, Cl. 123-139.0AW.

Akashi, Kageyasu; Hayashi, Yoshio; Arakawa, Tatsumi; Kimura, Takeo; and Kobayashi, Hidehiko, to Asahi Kasei Kogyo Kabushiki Kaisha. Dry image forming material containing diarylhalomethane. 4,188,226, Cl. 430-620.000.

Akashi, Shunji, to Yoshida Kogyo K K. Continuous slide fastener stringers. 4,187,591, Cl. 24-205.00R.

Akkerman, Neil H., to Baker International Corporation. Valve actuator and pilot assembly therefor. 4,187,870, Cl. 137-102.000.

Akkerman, Neil H., to Baker Cac, Inc. Spool valve and pilot interface assembly. 4,188,011, Cl. 251-63.400.

Akopian, Nina E.: *See*—
Mndzhoian, Oganes L.; Avetisian, Svetlana A.; Akopian, Nina E.; and Gerasimian, Dzhemma A., 4,188,398, Cl. 424-274.000.

Aktieselskabet Nordiske Kabel-OG Traadfabriker: *See*—
Andersen, Axel; Knudsen, Poul U.; and Jensen, Knud B., 4,188,088, Cl. 350-96.230.

Akzona Incorporated: *See*—
Bruins, Antonius H. N. M.; and Vollema, Gerlof, 4,188,338, Cl. 260-500.50H.

Albany International Corp.: *See*—
Bolton, Joseph A.; and Hoover, William, 4,188,078, Cl. 308-187.000.

Albert Rolland S.A.: *See*—
Thuillier, Germaine, born Nachmias; and Mignonac, Sylviane S. J., born Mondon, 4,188,388, Cl. 424-250.000.

Alcanzare, Eduardo V. Combat and transport vehicle body. 4,188,060, Cl. 296-63.000.

Alchem, Inc.: *See*—
Fless, Donald E., 4,188,205, Cl. 75-42.000.

Aldridge, Lionel D.; and Sprenkle, George J., to Burroughs Corporation. High density solder tail connector assembly for leadless integrated circuit packages. 4,188,085, Cl. 339-176.0MP.

Aldrin, Per O. Universal type machine tool. 4,187,601, Cl. 29-560.000.

Alexander, Alfred J.; Jibb, David J.; and Hollaway, Graham, to Elliott Brothers (London) Limited. Display apparatus. 4,188,627, Cl. 340-747.000.

Aliprandi, Giovanni; Ricci, Roberto; and Timossi, Giovanni, to SANAC Societa per Azioni Refrattari Argille e Calolini. Box discharger comprising reloadable refractory plates, with wedge locking. 4,187,965, Cl. 222-600.000.

Allen, Richard G.: *See*—
Meri, Kalju; and Allen, Richard G., 4,188,507, Cl. 179-6.00D.

Allen, Richard T.; Moyer, Rudolph H.; Sibbett, Donald J.; Anderson, Howard H.; Martner, Glen R.; and Willis, Don, to Geomet, Inc. Floating piston respirating pump. 4,187,836, Cl. 128-2.080.

Allen, Richard T.; Moyer, Rudolph H.; Sibbett, Donald J.; Anderson, Howard H.; Martner, Glen R.; and Willis, Don, to Geomet, Inc. Respirating pump. 4,187,859, Cl. 128-725.000.

Allen, Robert H., to University Patents, Inc. Quantitative testing for vitamin B_{12}. 4,188,189, Cl. 23-230.300.

Allied Chemical Corporation: *See*—
DeBernard, Lewis M., Jr.; and Mercer, Donald G., 4,188,430, Cl. 428-88.000.

Allington, Robert W., to Instrumentation Specialties Company. AC Detector for DC ground faults and high capacitance in high-voltage DC power supplies. 4,188,574, Cl. 324-51.000.

Allis-Chalmers Corporation: *See*—
Faulkner, Bobby P.; and Moore, Donald C., 4,188,287, Cl. 209-168.000.

Almore International, Inc.: *See*—
Larro, Harold D., 4,188,265, Cl. 435-313.000.

Alomar, Antonio D. Infants cot. 4,187,564, Cl. 5-94.000.

Alps Electric Co., Ltd.: *See*—
Yoshisato, Akiyuki, 4,188,579, Cl. 325-17.000.

Altec Corporation: *See*—
Henricksen, Clifford A.; and Ureda, Mark S., 4,187,926, Cl. 181-192.000.

Altenpohl, Paul J.: *See*—
Altenpohl, William F.; and Altenpohl, Paul J., 4,187,945, Cl. 209-592.000.

Altenpohl, William F.; and Altenpohl, Paul J., to W. F. Altenpohl, Inc. Plural path weight sorting system. 4,187,945, Cl. 209-592.000.

Althuis, Thomas H.; Harbert, Charles A.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., to Pfizer Inc. 1,9-Dihydroxyoctahydrophenanthrenes and intermediates therefor. 4,188,495, Cl. 568-633.000.

Aluminum Company of America: *See*—
Seger, Edward J.; and Haupin, Warren E., 4,188,267, Cl. 204-1.00T.

Alvarez, Patricio D., to ACF Industries, Incorporated. Gate valve with position responsive interlock. 4,188,014, Cl. 251-196.000.

Amberkar, Suresh D.; Hansen, Elwood F.; and Hansen, David E., to Dennison Manufacturing Company. Particulate filtering. 4,188,197, Cl. 55-382.000.

Amchem Company Limited: *See—*
Baker, George E., 4,188,522, Cl. 219-69.00M.

American Can Company: *See—*
Rohowetz, Stanley E., 4,188,437, Cl. 428-199.000.

American Cyanamid Company: *See—*
Los, Marinus, 4,188,487, Cl. 548-301.000.

American Home Products Corporation: *See—*
Sejpal, Vasant D., 4,188,412, Cl. 426-609.000.

American Optical Corporation: *See—*
Bartfay-Szabo, Stephen A., 4,188,116, Cl. 356-137.000.
Day, Christopher C.; and McEachern, Robert A., 4,187,858, Cl. 128-710.000.

Anchor/Darling Industries, Inc.: *See—*
Calabrese, Richard A.; and Fandetti, Robert E., 4,187,933, Cl. 188-134.000.

Anchor Hocking Corporation: *See—*
Bogart, Burton S., 4,187,964, Cl. 222-546.000.

Anderka, Gerold; and Jozat, Walter, to Koh-I-Noor Rapidograph, Inc. Method for regulating ink flow in drafting pens. 4,188,634, Cl. 346-1.100.

Andersen, Axel; Knudsen, Poul U.; and Jensen, Knud B., to Aktieselskabet Nordiske Kabel-OG Traadfabriker. Optical element for use in optical transmission means. 4,188,088, Cl. 350-96.230.

Anderson, Donald R. Treatment of industrial waste water. 4,188,291, Cl. 210-23.00H.

Anderson, Ernest L. Panel constructed building. 4,187,655, Cl. 52-236.600.

Anderson, Glenn W.: *See—*
Hutchison, Stanley O.; and Anderson, Glenn W., 4,187,911, Cl. 166-312.000.

Anderson, Howard H.: *See—*
Allen, Richard T.; Moyer, Rudolph H.; Sibbett, Donald J.; Anderson, Howard H.; Martner, Glen R.; and Willis, Don, 4,187,836, Cl. 128-2.080.
Allen, Richard T.; Moyer, Rudolph H.; Sibbett, Donald J.; Anderson, Howard H.; Martner, Glen R.; and Willis, Don, 4,187,859, Cl. 128-725.000.

Ando, Takao: *See—*
Morishita, Masanobu; Inoue, Hidehiko; Ando, Takao; and Kawasaki, Mitsuru, 4,188,642, Cl. 358-213.000.

Ando, Tsuneo: *See—*
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, 4,187,816, Cl. 123-139.0AW.

Annas, Robert I.: *See—*
Hochsprung, Dennis H.; Wright, Alan C.; Annas, Robert I.; and Purcell, Pat W., 4,188,624, Cl. 340-606.000.

Anneflod, Weimar A.: *See—*
Millgardh, Ulf J.; Lindberg, Ulf W.; Anneflod, Weimar A.; Werner, Nils H.; and Wimelius, Bjorn, 4,188,248, Cl. 156-164.000.

Anscher, Bernard. Internally threaded plastic nut. 4,188,178, Cl. 425-469.000.

Aono, Shigeo: *See—*
Hosaka, Akio; and Aono, Shigeo, 4,187,812, Cl. 123-119.0EC.

Appenzeller, Valentin, to Kusters, Eduard. Roll for pressure treating webs of material. 4,187,594, Cl. 29-116.0AD.

Arai, Kunihito: *See—*
Matsuura, Katsuji; and Arai, Kunihito, 4,188,421, Cl. 427-385.00A.

Arakawa, Tatsumi: *See—*
Akashi, Kageyasu; Hayashi, Yoshio; Arakawa, Tatsumi; Kimura, Takeo; and Kobayashi, Hidehiko, 4,188,226, Cl. 430-620.000.

Aratowerk Walter von Taschitzki: *See—*
von Taschitzki, Rainer, 4,187,804, Cl. 119-72.5RC.

Arcamone, Federico: *See—*
Suarato, Antonino; Masi, Paolo; Bernardi, Luigi; and Arcamone, Federico, 4,188,377, Cl. 424-180.000.

Archer, Duane L.: *See—*
Froning, H. Robert; Owens, William W.; and Archer, Duane L., 4,187,907, Cl. 166-275.000.

Arcuri, Joseph D., Jr., to Electric Power Research Institute, Inc. Sodium-sulfur battery and method of making a double carbon mat-composite sulfur electrode for use in sodium-sulfur cells. 4,188,463, Cl. 429-104.000.

Aries Electronics, Inc.: *See—*
Sinclair, William Y., 4,187,606, Cl. 29-629.000.

Arima, Yusaku: *See—*
Yoshioka, Toshihiro; Itaya, Shikiho; Arima, Yusaku; and Tanaka, Hirokazu, 4,188,365, Cl. 423-239.00A.

Aron, Daniel L., to Mole-Richardson Co. Adjustable support for portable lamp. 4,188,658, Cl. 362-396.000.

Artusy, Max T.: *See—*
Siegman, Anthony E.; Holmes, Neil C.; and Artusy, Max T., 4,188,591, Cl. 331-94.50P.

Arutjunova, Amalia A.: *See—*
Sarkisian, Levon A.; Matsoian, Stepan G.; Gabzimalian, Vagram G.; Mailian, Shaen M.; Galstian, Albert P.; Azarian, Vazgen K.; Ter-Davtian, Zorik S.; Gevorkian, Raya G.; Gevorkian, Ogden A.; Khudoian, Korjun L.; Ovsepian, Lavrenty A.; Arutjunova, Amalia A.; and Mkrtchian, Foerbakh V., 4,188,406, Cl. 426-3.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Akashi, Kageyasu; Hayashi, Yoshio; Arakawa, Tatsumi; Kimura, Takeo; and Kobayashi, Hidehiko, 4,188,226, Cl. 430-620.000.

Asakura, Hiroshi; Chimura, Ippei; Kitazume, Keisuke; Kaneko, Yoshiyuki; Fuse, Shirou; and Ueno, Akio, to Toyo Kagaku Kabushiki Kaisha. Adhesive tape. 4,188,439, Cl. 428-215.000.

Asakura, Hiroshi; Chimura, Ippei; Kitazume, Keisuke; Kaneko, Yoshiyuki; Fuse, Shirou; and Ueno, Akio, to Toyo Kagaku Kabushiki Kaisha. Adhesive tape. 4,188,442, Cl. 428-216.000.

Asano, Isao, to Babcock-Hitachi Kabushiki Kaisha. Narrow weld-groove welding process. 4,188,526, Cl. 219-137.800.

Ashenfelter, Ernest W.; Dickey, Fred M.; and White, Jerry R., to Boeing Company, The. Window transmittance tester. 4,188,533, Cl. 250-338.000.

Astero, Ulf J. E., to Asthausbolagen HB Astero & Stockhaus. Manually movable binding apparatus. 4,187,571, Cl. 11-1.0AD.

Asthausbolagen HB Astero & Stockhaus: *See—*
Astero, Ulf J. E., 4,187,571, Cl. 11-1.0AD.

Ateliers et Chantiers de Bretagne-A.C.B.: *See—*
Moreau, Claude; and Schreder, Rene, 4,188,166, Cl. 414-735.000.

Auchinleck, Richard J.: *See—*
Schisselbauer, John C.; Garczynski, John S.; Auchinleck, Richard J.; and LoFurno, Henry J., 4,187,980, Cl. 235-474.000.

Audoux, Guy, to Automobiles Peugeot; and Societe Anonyme Automobiles Citroen. Engine having a variable compression ratio. 4,187,808, Cl. 123-48.0AA.

Auerbach, Robert A., to Lord Corporation. Cold plasma modification of organic and inorganic surfaces. 4,188,426, Cl. 427-40.000.

Autoliv AB: *See—*
Lindblad, Oskar L., 4,187,925, Cl. 180-268.000.

Automecha Ltd.: *See—*
Brown, Frank H., 4,188,252, Cl. 156-361.000.

Automobiles Peugeot: *See—*
Achard, Michel, 4,187,742, Cl. 74-863.000.
Audoux, Guy, 4,187,808, Cl. 123-48.0AA.

Avetisian, Svetlana A.: *See—*
Mndzhoian, Oganes L.; Avetisian, Svetlana A.; Akopian, Nina E.; and Gerasimian, Dzhemma A., 4,188,398, Cl. 424-274.000.

Ayerst McKenna & Harrison, Inc.: *See—*
Jirkovsky, Ivo L., 4,188,389, Cl. 424-250.000.

Azarian, Vazgen K.: *See—*
Sarkisian, Levon A.; Matsoian, Stepan G.; Gabzimalian, Vagram G.; Mailian, Shaen M.; Galstian, Albert P.; Azarian, Vazgen K.; Ter-Davtian, Zorik S.; Gevorkian, Raya G.; Gevorkian, Ogden A.; Khudoian, Korjun L.; Ovsepian, Lavrenty A.; Arutjunova, Amalia A.; and Mkrtchian, Foerbakh V., 4,188,406, Cl. 426-3.000.

B. Braun Melsungen Aktiengesellschaft: *See—*
Brethauer, Ulrich, 4,187,719, Cl. 73-61.400.

B. F. Goodrich Company, The: *See—*
Rajput, Yudh V.; and Skodack, Gary J., 4,188,075, Cl. 303-106.000.
Stricharczuk, Paul T.; and Lawson, Dennis L., 4,188,448, Cl. 428-311.000.

B & J Machinery Company, Inc.: *See—*
Cobble, James T., 4,187,788, Cl. 112-79.00R.

Babbitless: *See—*
Petrini Poli, Denis, 4,187,991, Cl. 241-33.000.

Babcock-Hitachi Kabushiki Kaisha: *See—*
Asano, Isao, 4,188,526, Cl. 219-137.800.

Babcock & Wilcox Company, The: *See—*
Abell, Gary E., 4,188,167, Cl. 414-744.000.

Backlund, Sture O. E., to SCA Development Aktiebolag. Method of improving the homogeneity of lignocellulose containing material. 4,188,261, Cl. 162-42.000.

Badger Company, The: *See—*
Graham, James J.; and Vernon, Roger J., 4,188,290, Cl. 210-21.000.

Baker Cac, Inc.: *See—*
Akkerman, Neil H., 4,188,011, Cl. 251-63.400.

Baker, George E., to Amchem Company Limited. Method of machining a workpiece to a predetermined depth using a machining process in which machine tool wear occurs. 4,188,522, Cl. 219-69.00M.

Baker International Corporation: *See—*
Akkerman, Neil H., 4,187,870, Cl. 137-102.000.
Kovacs, Jozsef P., 4,187,906, Cl. 166-120.000.

Baker, Keith R., to Deere & Company. Fuel line injection sensor. 4,187,720, Cl. 73-119.00A.

Baker, Scott H.; and Manners, David E., to GTE Sylvania Incorporated. Startup circuit for a television receiver. 4,188,641, Cl. 358-190.000.

Bakumenko, Ljudmila A.: *See—*
Melnikov, Nikolai N.; Grapov, Artur F.; Razvodovskaya, Ljudmila V.; Popov, Petr V.; Sedykh, Aelita S.; Shapovalova, Galina K.; Abelentseva, Galina M.; Siforova, Tamara A.; Nikolaeva, Tatyana A.; Galitsina, Valentina V.; Stonov, Leonid D.; and Bakumenko, Ljudmila A., 4,188,382, Cl. 424-200.000.

Balzer, David J., to Caterpillar Tractor Co. Brake housing and actuating mechanism. 4,187,931, Cl. 188-72.100.

Balzers Patent-und Beteiligungs-Aktiegesellschaft: *See—*
Lichtenberg, Wolfgang, 4,188,417, Cl. 427-229.000.

Bannat, John W.: *See—*
Campoli, Ralph F.; Barrieres, Elie L.; Bannat, John W.; Steiner, Edwin G.; Lynch, Thomas A.; and Miller, Gary M., 4,187,783, Cl. 102-93.000.

Bant, John A.; and Raban, Victor J., to Lucas Industries Limited. Lead-acid batteries. 4,188,461, Cl. 429-48.000.

Barbanel, Sidney M.: *See*—
Barton, Steven A.; and Barbanel, Sidney M., 4,187,853, Cl. 128-419.0PT.
Barbieri, Siegfried; and Kapfinger, Wolfgang, to Durst AG Fabrik Fototechnischer Apparate. Apparatus for the determination of the color composition of the printing light in a photographic enlarger. 4,188,125, Cl. 356-404.000.
Barge, Jean; Catte, Raymond; Chapelet, Gilbert; Bui, Ai; Dejean, Pierre; Huraux, Claude; and Mayoux, Christian, to Agence Nationale de Valorisation de la Recherche (ANVAR). Polymeric electrical insulators having increased resistance to partial discharges containing metal chelates. 4,188,303, Cl. 252-63.700.
Barnacle, Leslie J. H., to Cosarnia Limited. Lead cropping apparatus. 4,187,751, Cl. 83-458.000.
Baron, Hubertus: *See*—
Lenart, Wolfgang; Rau, Wolfgang; and Baron, Hubertus, 4,188,132, Cl. 366-314.000.
Baronavski, Andrew P.: *See*—
McDonald, Jimmie R.; and Baronavski, Andrew P., 4,188,120, Cl. 356-318.000.
Barrieres, Elie L.: *See*—
Campoli, Ralph F.; Barrieres, Elie L.; Bannat, John W.; Steiner, Edwin G.; Lynch, Thomas A.; and Miller, Gary M., 4,187,783, Cl. 102-93.000.
Barrington, James E.: *See*—
Nuwayser, Elie S.; and Barrington, James E., 4,187,839, Cl. 128-79.000.
Bartfay-Szabo, Stephen A., to American Optical Corporation. Abbe refractometer. 4,188,116, Cl. 356-137.000.
Barton, Steven A.; and Barbanel, Sidney M. Electrode implanting apparatus with optimum location probe. 4,187,853, Cl. 128-419.0PT.
Bartrug, Norman G., to PPG Industries, Inc. Lost end rethread clip. 4,188,435, Cl. 428-167.000.
BASF Aktiengesellschaft: *See*—
Becker, Hans-Juergen; Jaeckh, Christof; Koester, Eberhard; Loeser, Werner; Ohlinger, Manfred; and Steck, Werner, 4,188,302, Cl. 252-62.560.
Fischer, Roman; Fliege, Werner; Koernig, Wolfgang; and Meissner, Bernd, 4,188,344, Cl. 260-590.00E.
Kempter, Fritz E.; Schupp, Eberhard; and Blum, Rainer, 4,188,312, Cl. 260-19.0EP.
Lenart, Wolfgang; Rau, Wolfgang; and Baron, Hubertus, 4,188,132, Cl. 366-314.000.
Basic Products Development Company, Inc.: *See*—
Turner, Lloyd S., 4,187,953, Cl. 215-301.000.
Baskin, Joseph M., to Boeing Company, The. Rotor blade internal damper. 4,188,171, Cl. 416-226.000.
Bathelt, Heinrich, to Hoechst Aktiengesellschaft. Mixture with low surface tension which consists of fluorinated alkylammonium monoalkyl sulfates and fluoroalkyl-sulfatobetaines. 4,188,307, Cl. 252-355.000.
Battersby, Robert J.; and Dietiker, Paul, to Honeywell Inc. Gas valve seating member. 4,188,013, Cl. 251-175.000.
Bauer, Randy L.; and Krulik, Gerald A. Method of preparing multicomponent chemical compositions. 4,188,227, Cl. 106-1.270.
Bauer, Wilhelm; Heinrich, Kurt; Klie, Wolfgang; Rau, Wolfgang; and Trost, Werner, to Daimler-Benz Aktiengesellschaft. Forward longitudinal bearer supported at the vehicle end wall of a self-supporting motor vehicle body. 4,188,059, Cl. 296-188.000.
Baumgarth, Manfred: *See*—
Orth, Dieter; Radunz, Hans-Eckart; Baumgarth, Manfred; Maisenbacher, Jurgen; and Lissner, Reinhard, 4,188,403, Cl. 424-330.000.
Bausch & Lomb Incorporated: *See*—
Wrue, Richard J., 4,187,574, Cl. 15-104.920.
Baxter Travenol Laboratories, Inc.: *See*—
Cullis, Herbert M.; Dorsey, Evelyn E.; and De Vries, James H., 4,187,979, Cl. 233-14.00R.
Bay City Boring: *See*—
Webber, Robert, 4,187,749, Cl. 82-2.700.
Bayer Aktiengesellschaft: *See*—
Bossert, Friedrich; Wehinger, Egbert; Meyer, Horst; Heise, Arend; Kazda, Stanislav; Stoepel, Kurt; Towart, Robertson; Vater, Wulf; and Schlossmann, Klaus, 4,188,395, Cl. 424-266.000.
Brandes, Wilhelm; and Daum, Werner, 4,188,401, Cl. 424-304.000.
Casper, Rudolf; Grober, Roland; Schabel, Karl-Heinz; and Siemer, Klaus, 4,188,196, Cl. 55-270.000.
Fell, Bernard; and Dolkemeyer, Wilfried, 4,188,363, Cl. 423-22.000.
Margotte, Dieter, 4,188,475, Cl. 528-175.000.
Maurer, Fritz; and Hammann, Ingeborg, 4,188,383, Cl. 424-200.000.
Straub, Otto C., 4,188,375, Cl. 424-88.000.
Weber, Gerd; Skoupi, Dieter; and Schafer, Hermann, 4,188,356, Cl. 264-40.100.
Wernicke, Hans J.; Watson, Allan; Kreuter, Walter; Mansmann, Manfred; and Weber, Horst, 4,188,281, Cl. 208-57.000.
Baysinger, Robert L.: *See*—
Rippelmeyer, Dennis M.; and Baysinger, Robert L., 4,188,181, Cl. 431-66.000.
Beard, Larry D.: *See*—
Coleman, Robert A.; and Beard, Larry D., 4,187,901, Cl. 165-47.000.
Beaty, Loma B. Noise dampened rotary saw blade. 4,187,754, Cl. 83-847.000.
Becker, Hans-Juergen; Jaeckh, Christof; Koester, Eberhard; Loeser, Werner; Ohlinger, Manfred; and Steck, Werner, to BASF Aktiengesellschaft. Manufacture of acicular cobalt-modified magnetic iron oxide. 4,188,302, Cl. 252-62.560.
Becker, James J., Jr.; and Beresford, Henry T. Spray dryer. 4,187,617, Cl. 34-57.00R.
Becton, Dickinson and Company: *See*—
Percarpio, Edward P., 4,187,952, Cl. 215-247.000.
Bedocs, Michael F., to Cherry Electrical Prod's. Corp. Keyboard switch actuator and locking assembly. 4,188,136, Cl. 400-276.000.
Beex, Aloysius A.: *See*—
Graupe, Daniel; Beex, Aloysius A.; and Causey, G. Donald, 4,188,667, Cl. 364-724.000.
Beggs, Donald; and Escott, Robert M., to Midrex Corporation. Hot discharge direct reduction furnace. 4,188,022, Cl. 266-195.000.
Behrenberg, Rolf: *See*—
Humpert, Jurgen; Eckel, Hans-Joachim; and Behrenberg, Rolf, 4,187,880, Cl. 137-625.170.
Bell Telephone Laboratories, Incorporated: *See*—
Lynes, Dennis J., 4,188,671, Cl. 365-149.000.
O'Connor, Robert J., 4,188,505, Cl. 179-1.0PC.
Reudink, Douglas O.; and Yeh, Yu S., 4,188,578, Cl. 325-4.000.
Wiese, Larry L., 4,188,601, Cl. 335-51.000.
Bendix Corporation, The: *See*—
Nevitt, James S., 4,187,715, Cl. 73-37.900.
Benton, Marvin E. Locking adapter for trailer towing mirror. 4,187,702, Cl. 70-57.000.
Beresford, Henry T.: *See*—
Becker, James J., Jr.; and Beresford, Henry T., 4,187,617, Cl. 34-57.00R.
Berg, Charles A., to Owens-Illinois, Inc. Solar powered intermittent cycle heat pump. 4,187,688, Cl. 62-2.000.
Berg, Charles A., to Pyreflex Corporation. Process and apparatus for controllably exchanging heat between two bodies. 4,188,519, Cl. 219-10.470.
Bernardi, Luigi: *See*—
Suarato, Antonino; Masi, Paolo; Bernardi, Luigi; and Arcamone, Federico, 4,188,377, Cl. 424-180.000.
Bernstein, Phillip: *See*—
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Bertram, Wolfgang: *See*—
Detert, Klaus; Bertram, Wolfgang; and Fischdick, Hermann, 4,188,419, Cl. 427-287.000.
Besik, Ferdinand. Process for purification of sanitary waters. 4,188,289, Cl. 210-7.000.
Beta Aluminium Products Limited: *See*—
Thompson, Norman, 4,187,641, Cl. 49-403.000.
Betancourt, Jorge; and Hernandez, Jose. Apparatus for automatically kneading and stretching a mixture. 4,188,128, Cl. 366-72.000.
BFG Glassgroup: *See*—
Groth, Rolf, 4,188,452, Cl. 428-336.000.
Van Laethem, Robert; Leclercq, Robert; Capouillet, Phileas; and Van Cauter, Albert, 4,188,199, Cl. 65-60.00C.
Bhattacherjee, Parimal: *See*—
Eakins, Kenneth E.; and Bhattacherjee, Parimal, 4,188,394, Cl. 424-262.000.
Bhimji, Amir A., to General Foods Corporation. Food extruder pressure indicator. 4,187,727, Cl. 73-706.000.
Bianchini, Claudio: *See*—
Pestellini, Vittorio; Ghelardoni, Mario; Bianchini, Claudio; Del Soldato, Piero; Volterra, Giovanna; and Meli, Alberto, 4,188,323, Cl. 548-229.000.
Biber, Conrad H.; Johnson, Bruce K.; and Whiteside, George D., to Polaroid Corporation. Range synchronized flash photographic apparatus and method for achieving optimum flash exposure. 4,188,103, Cl. 354-27.000.
Bilow, Norman; Landis, Abraham L.; and Miller, Leroy J., to Hughes Aircraft Company. Nitrile substituted polyimide precursors. 4,188,337, Cl. 260-465.00D.
Binns, Kenneth J., to University of Southampton, The. Alternating current rotating electric machine. 4,188,554, Cl. 310-156.000.
Bio-Rad Laboratories, Inc.: *See*—
Willner, Howard; and Kapteyn, Robert J., 4,188,188, Cl. 23-230.00B.
Birjukov, Sergei B.: *See*—
Gavrev, Valery S.; Goncharuk, Jury M.; Birjukov, Sergei B.; Savitsky, Alexandr V.; and Popova, Ljudmila A., 4,187,725, Cl. 73-613.000.
Bissi, Rebecca A. Method for producing decorative fabric. 4,187,592, Cl. 28-163.000.
Blachura, Leon, to North Oakland Development Corporation. Home building method and apparatus. 4,187,65[illegible], Cl. 52-745.000.
Black Bocs, Ltd.: *See*—
Olmstead, Edward A., 4,187,726, Cl. 73-660.000.
Black, John O. Vertical ascending and descending airplane. 4,187,999, Cl. 244-12.500.
Blasinachim S.p.A.: *See*—
Castelli, Pier P.; and Romano, Bruno, 4,188,322, Cl. 260-239.55R.
Blau, James R. Snow plow. 4,187,624, Cl. 37-42.00R.
Blum, Rainer: *See*—
Kempter, Fritz E.; Schupp, Eberhard; and Blum, Rainer, 4,188,312, Cl. 260-19.0EP.
Blumenaus, Jon M., to World Carpets, Inc. Method of print dyeing textile materials. 4,188,216, Cl. 430-22.000.
Bobrovnikov, Anatoly P.; Zakharov, Alexandr V.; Soloviev, Gennady I.; Mikhailov, Gennady G.; Golubeva, Tamara N.; and Glushkova,

Nina N. Space structure of a roof covering for a building. 4,187,652, Cl. 52-90.000.
Boehringer Mannheim GmbH: *See—*
Schneider, Walter; Roder, Albert; Mollering, Hans; and Gutmann, Ingeborg. 4,188,465, Cl. 435-12.000.
Boeing Company, The: *See—*
Ashenfelter, Ernest W.; Dickey, Fred M.; and White, Jerry R., 4,188,533, Cl. 250-338.000.
Baskin, Joseph M., 4,188,171, Cl. 416-226.000.
Hametner, Albert L.; and Soderberg, Mark S., 4,187,889, Cl. 140-92.100.
Shen, Jan-aon, 4,187,682, Cl. 60-413.000.
Soderberg, Mark S., 4,188,041, Cl. 279-75.000.
Bogan, David B. Toilet riser. 4,187,561, Cl. 4-116.000.
Bogart, Burton S., to Anchor Hocking Corporation. Combined closure cap and pour-out fitment. 4,187,964, Cl. 222-546.000.
Bohme, Rolf C.; and Luck, Dieter G., to General Mining and Finance Corporation Limited. Loaders for use in tunnels. 4,188,165, Cl. 414-694.000.
Boisde, Gilbert; and Boissier, Alain, to Commissariat a l'Energie Atomique. Photometer with concave mirrors and field optics. 4,188,126, Cl. 356-440.000.
Boissier, Alain: *See—*
Boisde, Gilbert; and Boissier, Alain, 4,188,126, Cl. 356-440.000.
Bokelman, Gordon H.: *See—*
Mitscher, Lester A.; Clark, George W., III; and Bokelman, Gordon H., 4,188,329, Cl. 260-343.30P.
Boling, Norman L., to Owens-Illinois, Inc. Generation of electrical energy from sunlight, and apparatus. 4,188,238, Cl. 136-89.0FC.
Boling, Norman L., to Owens-Illinois, Inc. Luminescent solar collector structure. 4,188,239, Cl. 136-89.0FC.
Bolton, Joseph A.; and Hoover, William, to Albany International Corp. Bearing lubrication system for bowed rolls. 4,188,078, Cl. 308-187.000.
Bomar, Richard L.; and Duarte, Jesus, to Bourns, Inc. Phaseable impedance device. 4,188,606, Cl. 338-137.000.
Bongianni, Wayne L., to Rockwell International Corporation. Fixed frequency filters using epitaxial ferrite films. 4,188,594, Cl. 332-16.00R.
Bonin, Jean-Claude, to CAV RotoDiesel. Fuel injection pumps for internal combustion engines. 4,188,175, Cl. 417-462.000.
Bonk, Joseph P., to Kendall Company, The. Dispenser with cap and protective member. 4,187,960, Cl. 222-107.000.
Boots Company Limited, The: *See—*
Nicholson, John S.; and Turner, John L., 4,188,491, Cl. 562-492.000.
Borg Textile Corporation: *See—*
Koegel, Ralph A., 4,187,700, Cl. 66-111.000.
Boser, Ronald J.; Siegel, Walter P.; and Picciotti, Michael F., to Union Special Corporation. Thread trimmer. 4,187,792, Cl. 112-286.000.
Bosio, Roberto: *See—*
Pasini, Arnaldo; Dalmasso, Claudio; Brescia, Riccardo; and Bosio, Roberto, 4,188,139, Cl. 400-696.000.
Bosniack, David S.; and Korbach, Paul F., to Exxon Research & Engineering Co. Conversion of sulfonic acids into a hydrocarbon oil of superior oxidation stability. 4,188,500, Cl. 585-1.000.
Bossert, Friedrich; Wehinger, Egbert; Meyer, Horst; Heise, Arend; Kazda, Stanislav; Stoepel, Kurt; Towart, Robertson; Vater, Wulf; and Schlossmann, Klaus, to Bayer Aktiengesellschaft. 1,4-Dihydropyridine derivatives substituted in the 2 position, and their use as medicaments. 4,188,395, Cl. 424-266.000.
Bottino, Aldo: *See—*
Munari, Stelio; Vigo, Fernando; Capannelli, Gustavo; Uliana, Claudio; and Bottino, Aldo, 4,188,354, Cl. 264-22.000.
Bourns, Inc.: *See—*
Bomar, Richard L.; and Duarte, Jesus, 4,188,606, Cl. 338-137.000.
Bouyoucos, John V., to Hydroacoustics, Inc. Pile driver. 4,187,917, Cl. 173-131.000.
Bower, Bruce L.; and Kohler, Raymond H., to GTE Sylvania Incorporated. Direct drive ballast with starting circuit. 4,188,661, Cl. 363-49.000.
Bower, David S.; and Smith, Fred J., to Digital Products Corporation. Telephone sequential number dialer with number incrementing. 4,188,510, Cl. 179-90.0BD.
Boyd, Alistair B.: *See—*
Robertson, George H.; Boyd, Alistair B.; and Rooney, Robert L., 4,188,236, Cl. 106-308.00Q.
Boyer, Harold, to National Cellulose Corporation. Plural component-multi state mixing and encapsulating nozzle. 4,187,983, Cl. 239-9.000.
Boykin, Richard A.; and Hamilton, Gordon A., to Champion International Corporation. Two piece produce box. 4,187,977, Cl. 229-43.000.
Bozon, Alfred: *See—*
Volker, Herbert; Koberstein, Edgar; Bozon, Alfred; and Hensel, Jorg. 4,188,309, Cl. 252-466.00J.
Brackbill, Warren H.; and Sadler, Loren G., to Sperry Rand Corporation. Manure spreader paddle attachment. 4,187,988, Cl. 239-662.000.
Braconnier, Daniel; Guillermin, Rene; and Sangalli, Sylvio, to Rhone-Poulenc-Textile. Pile textile elements with fused wrapper and base. 4,188,429, Cl. 428-85.000.
Brand, Boris P.: *See—*
Payne, David T.; and Brand, Boris P., 4,188,376, Cl. 424-173.000.
Brandes, Wilhelm; and Daum, Werner, to Bayer Aktiengesellschaft. Combating fungi with 1-(ω-substituted pentyl)-3-(2-cyano-acetyl)-ureas. 4,188,401, Cl. 424-304.000.
Brantingham, George L.: *See—*
Frantz, Gene A.; and Brantingham, George L., 4,188,626, Cl. 340-711.000.
Brault, Albert T.: *See—*
Wilkes, Glenn R.; and Brault, Albert T., 4,188,217, Cl. 430-353.000.
Braun, Joseph M. Fingernail stimulating apparatus. 4,187,837, Cl. 128-32.000.
Bregi, James F., to Ford Motor Company. Iron and/or steel treatment with magnesium and refractory coated composite shot. 4,188,210, Cl. 75-130.00R.
Bremer, Robert C., Jr., to Wallace Murray Corporation. Torsional vibration damper having two part hub. 4,187,597, Cl. 29-281.300.
Brennen, Michael B.: *See—*
Gyugyi, Laszlo; and Brennen, Michael B., 4,188,573, Cl. 323-119.000.
Brescia, Riccardo: *See—*
Pasini, Arnaldo; Dalmasso, Claudio; Brescia, Riccardo; and Bosio, Roberto, 4,188,139, Cl. 400-696.000.
Brethauer, Ulrich, to B. Braun Melsungen Aktiengesellschaft. Apparatus to determine the sedimentation rate of red blood cells. 4,187,719, Cl. 73-61.400.
Brimer, Claude M., to Linear International Corporation. Garage door opener including a linear actuator. 4,188,552, Cl. 310-13.000.
Brindle, Patrick A.: *See—*
Rogers, Herbert I.; Chappelle, Michael C.; Brindle, Robert G.; and Brindle, Patrick A., 4,188,508, Cl. 179-18.0DA.
Brindle, Robert G.: *See—*
Rogers, Herbert I.; Chappelle, Michael C.; Brindle, Robert G.; and Brindle, Patrick A., 4,188,508, Cl. 179-18.0DA.
British Steel Corporation: *See—*
Pereira, Joseph K.; and White, Martin, 4,187,900, Cl. 165-8.000.
Bro, Per: *See—*
Kang, Hong Y.; and Bro, Per, 4,188,460, Cl. 429-7.000.
Brooks, Robert A.: *See—*
Mhatre, Girish P.; and Brooks, Robert A., 4,188,577, Cl. 324-220.000.
Brower, Harold E.; and Brower, Jeffrey H. Multiple use weight lifting exercising device. 4,188,029, Cl. 272-62.000.
Brower, Jeffrey H.: *See—*
Brower, Harold E.; and Brower, Jeffrey H., 4,188,029, Cl. 272-62.000.
Brown, Frank H., to Automecha Ltd. Label positioning and applying apparatus. 4,188,252, Cl. 156-361.000.
Brown, Kenneth H.; Carr, Michael E.; and Rook, Charles W., to Motorola, Inc. Automatic signal acquisition means for a phase locked loop with anti-sideband lock protection. 4,188,589, Cl. 331-12.000.
Brown Manufacturing Corporation: *See—*
Harden, Jerrell W.; and Brown, William P., 4,187,916, Cl. 172-146.000.
Brown, Richard E.; and Unangst, Paul C., to Warner-Lambert Company. Indolopyrones having anti-allergic activity. 4,188,326, Cl. 260-326.290.
Brown & Sharpe Manufacturing Company: *See—*
Scott, Ian M., 4,187,612, Cl. 33-172.00E.
Brown, William J.; and Rowley, James R., to PPG Industries, Inc. Bow and spreader bar. 4,188,168, Cl. 414-786.000.
Brown, William L., Jr., to Caterpillar Tractor Co. High swirl inlet port. 4,187,823, Cl. 123-188.00M.
Brown, William P.: *See—*
Harden, Jerrell W.; and Brown, William P., 4,187,916, Cl. 172-146.000.
Browning, Charles W. Line threading and cutting device. 4,188,052, Cl. 289-17.000.
Bruins, Antonius H. N. M.; and Vollema, Gerlof, to Akzona Incorporated. Hydroxamic acids and process for making same. 4,188,338, Cl. 260-500.50H.
Brunner, Eduard: *See—*
Schmid, Pierre; Brunner, Eduard; and Stofer, Walter, 4,188,506, Cl. 179-1.50R.
Brunson, Raymond D. Radiant energy to electrical power conversion system. 4,188,571, Cl. 322-2.00R.
Brunsting, Albert; and Hogg, Walter R., to Coulter Electronics, Inc. Ellipsoid radiation collector apparatus and method. 4,188,543, Cl. 250-458.000.
Brunsting, Albert: *See—*
Hogg, Walter R.; and Brunsting, Albert, 4,188,542, Cl. 250-458.000.
Brunswick Corporation: *See—*
Lanpheer, Richard A.; and Kusche, David W., 4,187,809, Cl. 123-65.0EM.
Brzozowski, Stanley F., to PPG Industries, Inc. Fiber glass making pellets containing fiber glass cullet. 4,188,228, Cl. 106-50.000.
Bucher, Charles A.: *See—*
Wissel, Frank A.; and Bucher, Charles A., 4,188,585, Cl. 325-492.000.
Bucyrus-Erie Company: *See—*
Johnson, Kenneth V., 4,187,681, Cl. 60-395.000.
Buczek, Carl J.; Freiberg, Robert J.; Fradin, David W.; and Chenausky, Peter P., to United Technologies Corporation. Closed cycle chemical laser. 4,188,592, Cl. 331-94.50G.
Budapesti Muszaki Egyetem: *See—*
Juhasz, Zoltan; and Varju, Gyula, 4,188,233, Cl. 106-97.000.
Budnick, Edward G., to Plains Chemical Development Co. Chelation. 4,188,234, Cl. 106-267.000.
Buehner, Joseph F. Poppet valve stroke adjusting device for, and combination with, an internal combustion valve in head engine. 4,187,810, Cl. 123-90.160.

Bui, Ai: *See*—
Barge, Jean; Catte, Raymond; Chapelet, Gilbert; Bui, Ai; Dejean, Pierre; Huraux, Claude; and Mayoux, Christian, 4,188,303, Cl. 252-63.700.
Bujan, Albert F., to Abbott Laboratories. Combined additive and administration port for a container. 4,187,893, Cl. 150-8.000.
Bull, Michael J., to Shell Oil Company. Furylmethyloxime ethers. 4,188,400, Cl. 424-285.000.
Bullock, Allen R., to Simon Container Machinery Limited. Apparatus for folding box blanks. 4,187,769, Cl. 93-52.000.
Bundy, Gordon L., to Upjohn Company, The. Trans-2,3-didehydro-9-deoxy-9-methylene-PGF,1,11- or 1,15-lactones. 4,188,332, Cl. 260-343.410.
Bunker Ramo Corporation: *See*—
Inouye, Hiromasa; Ohtsuki, Tomonari; and Igarashi, Yoshiaki, 4,188,086, Cl. 339-176.0MF.
Buresi, Georges; and Grappe, Rene G., to Compagnie Francaise des Petroles. Underwater electrical connectors. 4,188,084, Cl. 339-117.00R.
Burge, Donald G., to Parker-Hannifin Corporation. Tube coupling. 4,188,051, Cl. 285-104.000.
Burnett, Willis R., to Mid-Florida Pools and Repair, Inc. Apparatus for chlorinating and filtering water for swimming pools during filling operation. 4,188,295, Cl. 210-206.000.
Burns, Carmen D., to National Semiconductor Corporation. Antioxidant coating of copper parts for thermal compression gang bonding of semiconductive devices. 4,188,438, Cl. 428-209.000.
Burroughs Corporation: *See*—
Aldridge, Lionel D.; and Sprenkle, George J., 4,188,085, Cl. 339-176.0MP.
Ragle, Herbert U.; and DeMoss, Dean, 4,188,645, Cl. 360-75.000.
Burroughs Wellcome Co.: *See*—
Yoshikumi, Chikao; Omura, Yoshio; and Hotta, Tetsuya, 4,188,384, Cl. 424-180.000.
Burtest Products Corp.: *See*—
Cohen, Jerome H., 4,187,627, Cl. 38-66.000.
Burton, Johnny A. Cigarette clipper. 4,187,865, Cl. 131-250.000.
Butler, Calvin J. Method and apparatus for measuring liquid volume to be withdrawn from a container. 4,187,957, Cl. 222-1.000.
Buzby, Nicholas L. Drive and motion synchronizing apparatus for a hydraulic system. 4,187,762, Cl. 91-37.000.
B.V. Neratoom: *See*—
Essebaggers, Jan, 4,187,874, Cl. 137-533.110.
Byrne, James E., to UEC Manufacturing Company. Remotely actuated auxiliary pressurization system. 4,187,927, Cl. 182-2.000.
Cahen, Raymond M. Process for selectively hydrogenating polyenic compounds in oils. 4,188,333, Cl. 260-409.000.
Cailloux, Michel, to Ogee Alsthom. Static AC/AC thyristor converter for a self-driven synchronous motor. 4,188,659, Cl. 363-37.000.
Calabrese, Richard A.; and Fandetti, Robert E., to Anchor/Darling Industries, Inc. Mechanical snubber assembly. 4,187,933, Cl. 188-134.000.
California Cedar Products Company: *See*—
Trinchera, Luigi, 4,188,524, Cl. 219-85.0CM.
California Institute of Technology: *See*—
Perkins, Gerald S., 4,188,174, Cl. 417-432.000.
Calleance, Dave. Water mattress construction. 4,187,569, Cl. 5-451.000.
Cambio, Orlando D., Jr., to Respiratory Care, Inc. Blow molded bottle with diffuser and method for making same. 4,187,951, Cl. 215-6.000.
Cameron Iron Works, Inc.: *See*—
Fisher, Edmund A.; and Schnitzer, Emanuel, 4,188,156, Cl. 405-195.000.
Webster, George R., 4,187,883, Cl. 137-625.680.
Campbell, Graeme R., to Lucas Industries Limited. Control circuit for an electric vehicle traction motor. 4,188,569, Cl. 318-375.000.
Campbell, Simon F., to Pfizer Inc. Antihypertensive 4-amino-2-[4-(1,4-benzodioxan-2-carbonyl) piperazin-1-yl or homopiperazin-1-yl]quinazolines. 4,188,390, Cl. 424-251.000.
Campbell, Simon F.; Danilewicz, John C.; Ham, Allan L.; and Stubbs, John K., to Pfizer Inc. 4-[4-(Substituted)piperidino]quinazoline cardiac stimulants. 4,188,391, Cl. 424-251.000.
Campoli, Ralph F.; Barrieres, Elie L.; Bannat, John W.; Steiner, Edwin G.; Lynch, Thomas A.; and Miller, Gary M., to United States of America, Army. Discarding sabot munition. 4,187,783, Cl. 102-93.000.
Canadair Limited: *See*—
Gray, Laurence W., 4,188,149, Cl. 403-271.000.
Cannalte, Gary A.; Chapman, Ronald H.; and Rozanski, Walter J., Jr., to Motorola, Inc. Simulcast transmission system having phase-locked remote transmitters. 4,188,582, Cl. 325-58.000.
Cannom, David L.; and Del Rio, Carlos M. Variable impedance device. 4,188,607, Cl. 338-224.000.
Canon Kabushiki Kaisha: *See*—
Momiyama, Kikuo, 4,188,092, Cl. 350-214.000.
Uchiyama, Takashi; Taguchi, Tetsuya; and Mashimo, Yukio, 4,188,104, Cl. 354-31.000.
Cantrill, James E.: *See*—
Cox, Myron K.; McGrath, William J.; and Cantrill, James E., 4,187,714, Cl. 73-9.000.
Capannelli, Gustavo: *See*—
Munari, Stelio; Vigo, Fernando; Capannelli, Gustavo; Uliana, Claudio; and Bottino, Aldo, 4,188,354, Cl. 264-22.000.
Capouillet, Phileas: *See*—
Van Laethem, Robert; Leclercq, Robert; Capouillet, Phileas; and Van Cauter, Albert, 4,188,199, Cl. 65-60.00C.
Caprio, Louis W., Jr. Ankle supporter. 4,187,844, Cl. 128-166.000.
Carminucci, Robert N.: *See*—
Lolachi, Houshang; and Carminucci, Robert N., 4,187,846, Cl. 128-214.00R.
Carr, Michael E.: *See*—
Brown, Kenneth H.; Carr, Michael E.; and Rook, Charles W., 4,188,589, Cl. 331-12.000.
Carville, Charles; and Laffitte, Andre, to Compagnie Generale de Radiologie. Rotary anode X-ray tube. 4,188,559, Cl. 313-60.000.
Case, Derek F.: *See*—
Ridgway, Peter C.; and Case, Derek F., 4,188,247, Cl. 156-154.000.
Caspari, Gunter, to Standard Oil Company (Indiana). Oil soluble dithiophosphoric acid derivatives of mercaptothiadiazoles. 4,188,299, Cl. 252-46.400.
Casper, Rudolf; Grober, Roland; Schabel, Karl-Heinz; and Siemer, Klaus, to Bayer Aktiengesellschaft. Absorber with suction pump. 4,188,196, Cl. 55-270.000.
Casper, Selma M.: *See*—
Zwiren, Jan M.; Casper, Selma M.; and Sinclair, Norman, 4,187,866, Cl. 132-151.000.
Castelli, Pier P.; and Romano, Bruno, to Blasinachim S.p.A. Process for the preparation of 6-halo-pregnanes. 4,188,322, Cl. 260-239.55R.
Castelo, Angel. Jewel mounting structure. 4,187,697, Cl. 63-31.000.
Catalysts & Chemical Industries: *See*—
Yoshioka, Toshihiro; Itaya, Shikiho; Arima, Yusaku; and Tanaka, Hirokazu, 4,188,365, Cl. 423-239.00A.
Caterpillar Tractor Co.: *See*—
Balzer, David J., 4,187,931, Cl. 188-72.100.
Brown, William L., Jr., 4,187,823, Cl. 123-188.00M.
Cemenska, Richard A.; and Goloff, Alexander, 4,187,807, Cl. 123-41.340.
Davenport, Richard G., 4,187,936, Cl. 192-21.000.
Gladden, John R., 4,188,364, Cl. 423-213.200.
Livesay, Richard E., 4,187,744, Cl. 81-3.00R.
Catte, Raymond: *See*—
Barge, Jean; Catte, Raymond; Chapelet, Gilbert; Bui, Ai; Dejean, Pierre; Huraux, Claude; and Mayoux, Christian, 4,188,303, Cl. 252-63.700.
Causey, G. Donald: *See*—
Graupe, Daniel; Beex, Aloysius A.; and Causey, G. Donald, 4,188,667, Cl. 364-724.000.
CAV RotoDiesel: *See*—
Bonin, Jean-Claude, 4,188,175, Cl. 417-462.000.
Cavalieri D'Oro, Enzo, to Societa Italiana Telecomunicazioni Siemens S.p.A. Cavity resonator having ancillary cylinder for suppressing parasitic mode. 4,188,600, Cl. 333-228.000.
Cawley, John D., to Eastman Kodak Company. Rupturable fluid container and elements containing same. 4,188,219, Cl. 430-208.000.
Cellsystem AG: *See*—
Izatt, James P., 4,188,154, Cl. 405-43.000.
CEM-Compagnie Electro-Mecanique: *See*—
Sterlini, Jacques, 4,187,899, Cl. 165-1.000.
Cemenska, Richard A.; and Goloff, Alexander, to Caterpillar Tractor Co. Cooled engine valve with improved heat transfer. 4,187,807, Cl. 123-41.340.
Century Brass Products, Inc.: *See*—
Northrop, Richard A., Jr.; and Wanat, David J., 4,187,683, Cl. 60-527.000.
Cerny, Jacqueline; and Vivant, Gilbert, to Rhone-Poulenc Industries. Compositions intended for the flameproofing of plastics. 4,188,313, Cl. 260-37.0EP.
Cervato, Giuseppe: *See*—
Portelli, Mario; DellaBella, Davide; Cervato, Giuseppe; and Marca, Gianfranco, 4,188,402, Cl. 424-324.000.
Chaffee, William H., to Technical Exhibits Corporation. Frame construction. 4,187,649, Cl. 52-36.000.
Champion International Corporation: *See*—
Boykin, Richard A.; and Hamilton, Gordon A., 4,187,977, Cl. 229-43.000.
Cohn, Robert, 4,188,414, Cl. 427-45.100.
Mather, George A., 4,187,976, Cl. 229-41.00B.
Champoux, Louis A., to Industrial Wire & Metal Forming, Inc. Pulling apparatus and method. 4,187,708, Cl. 72-30.000.
Chan, Kai C., to University of Iowa Research Foundation. Dental retention pin and method. 4,187,611, Cl. 433-225.000.
Chang, Clarence D.; and Lang, William H., to Mobil Oil Corporation. Conversion of synthesis gas to aromatic hydrocarbons. 4,188,336, Cl. 260-449.00R.
Chang, Mike F.; Roesch, Alfred; and Kennedy, Richard W., to General Electric Company. Selective open tube aluminum diffusion. 4,188,245, Cl. 148-188.000.
Chang, Wen-Hsuan, to PPG Industries, Inc. Curable lactone derived resins. 4,188,472, Cl. 528-75.000.
Chapelet, Gilbert: *See*—
Barge, Jean; Catte, Raymond; Chapelet, Gilbert; Bui, Ai; Dejean, Pierre; Huraux, Claude; and Mayoux, Christian, 4,188,303, Cl. 252-63.700.
Chapman, Ronald H.: *See*—
Cannalte, Gary A.; Chapman, Ronald H.; and Rozanski, Walter J., Jr., 4,188,582, Cl. 325-58.000.
Chappelle, Michael C.: *See*—
Rogers, Herbert I.; Chappelle, Michael C.; Brindle, Robert G.; and Brindle, Patrick A., 4,188,508, Cl. 179-18.0DA.
Chasson, Leon H., to Weyerhaeuser Company. Method and apparatus for automatically processing a workpiece employing calibrated scanning. 4,188,544, Cl. 250-560.000.

Chasteen, Jack W., to University of Dayton. Method for cleaning metal parts with elemental fluorine. 4,188,237, Cl. 134-2.000.

Chatterjee, Arun: *See—*
Hamma, Karlmann; Ott, Anton; Vetter, Werner; and Chatterjee, Arun, 4,187,739, Cl. 74-732.000.

Cheatham, Samuel D.; Robinson, Neil L.; and Smathers, Edmond W., to International Business Machines Corporation. Magnetic head having a jagged-edged gap, and method for producing such head. 4,188,649, Cl. 360-118.000.

Chem-Y, Fabriek Van Chemische Produkten B.V.: *See—*
Aalbers, Johan G.; and Van Paassen, Nicolaas I., 4,188,311, Cl. 252-551.000.

Chenausky, Peter P.: *See—*
Buczek, Carl J.; Freiberg, Robert J.; Fradin, David W.; and Chenausky, Peter P., 4,188,592, Cl. 331-94.50G.

Cherry Electrical Prod's. Corp.: *See—*
Bedocs, Michael F., 4,188,136, Cl. 400-276.000.

Cheshire, Ernest L., to UOP Inc. Vehicle seat hinge mechanism. 4,188,064, Cl. 297-367.000.

Chesnut, W. Richard, to W. R. Chesnut Engineering, Inc. Rotary die lock structure. 4,187,752, Cl. 83-663.000.

Chevron Research Company: *See—*
Hutchison, Stanley O.; and Anderson, Glenn W., 4,187,911, Cl. 166-312.000.
Jensen, Harbo P., 4,188,280, Cl. 208-53.000.
Michlmayr, Manfred J., 4,188,285, Cl. 208-246.000.
Suzuki, Shigeto, 4,188,494, Cl. 562-580.000.

Chicago Bridge & Iron Company: *See—*
Selcukoglu, Yuksel A.; Husain, Matloob; and Hanke, Carl C., Jr., 4,187,689, Cl. 62-54.000.

Chielens, Alain; Deschamps, Bernard; and Marchal, Gerard, to Fives-Cail Babcock. Thrust bearing for taking up axial thrust of a rotating cylinder. 4,188,077, Cl. 308-135.000.

Chimura, Ippei: *See—*
Asakura, Hiroshi; Chimura, Ippei; Kitazume, Keisuke; Kaneko, Yoshiyuki; Fuse, Shirou; and Ueno, Akio, 4,188,439, Cl. 428-215.000.
Asakura, Hiroshi; Chimura, Ippei; Kitazume, Keisuke; Kaneko, Yoshiyuki; Fuse, Shirou; and Ueno, Akio, 4,188,442, Cl. 428-216.000.

Cho, Nakwon, to United States of America, Energy. Fast-acting valve actuator. 4,187,764, Cl. 91-442.000.

Chromatex, Inc.: *See—*
Hill, Philip R., 4,188,445, Cl. 428-246.000.

Chrysler Corporation: *See—*
Tallon, Thomas G.; and Harris, Gerald A., 4,188,655, Cl. 362-80.000.

Chugai Seiyaku Kabushiki Kaisha: *See—*
Kamachi, Shinichi; and Ohkura, Yosuke, 4,188,320, Cl. 260-202.000.

Chung, Chan I., to Exxon Research & Engineering Co. Elastomer blend composition of a sulfonated EPDM terpolymer and a polystyrene resin. 4,188,351, Cl. 260-33.6AQ.

Chupp, John P., to Monsanto Company. Ortho-bromination of ortho-alkylated anilines. 4,188,342, Cl. 260-578.000.

Ciba-Geigy Corporation: *See—*
Felder, Louis; and Kirchmayr, Rudolf, 4,188,224, Cl. 204-159.150.
Fischer, Hanspeter, 4,188,341, Cl. 260-573.000.
Haas, Georges; Rossi, Alberto; Ferrini, Pier G.; and Schier, Oswald, 4,188,396, Cl. 424-267.000.
Hoegerle, Karl, 4,188,483, Cl. 544-302.000.
Robertson, George H.; Boyd, Alistair B.; and Rooney, Robert L., 4,188,236, Cl. 106-308.00Q.
Wehner, Wolfgang; and Wirth, Hermann O., 4,188,334, Cl. 260-429.700.

Cincinnati Electronics Corporation: *See—*
Wissel, Frank A.; and Bucher, Charles A., 4,188,585, Cl. 325-492.000.

Citizen Watch Co., Ltd.: *See—*
Mizutani, Nagao; Sawada, Takashi; Okawara, Yasuo; Koizumi, Michio; and Kurihara, Toshio, 4,188,135, Cl. 400-214.000.
Nishimura, Katsuo; and Nanya, Takanori, 4,188,095, Cl. 350-357.000.

Citrin, Paul S., to Indicon Inc. Replaceable tip for a pipette. 4,187,724, Cl. 73-425.40P.

Citron, Paul: *See—*
Hepp, Dennis G.; Neumann, Robert A.; and Citron, Paul, 4,187,854, Cl. 128-419.0PG.

Clarion Co., Ltd.: *See—*
Kanai, Takao; and Nishikawa, Yashuhisa, 4,187,729, Cl. 74-10.900.

Clark Equipment Company: *See—*
Gaylord, Richard P., 4,187,766, Cl. 92-169.000.

Clark, George W., III: *See—*
Mitscher, Lester A.; Clark, George W., III; and Bokelman, Gordon H., 4,188,329, Cl. 260-343.30P.

Clark, Wallace. Down-hole earth drilling motor capable of free circulation. 4,187,918, Cl. 175-39.000.

Clarke, Angus J.: *See—*
Clarke, Stanley W.; and Clarke, Angus J., 4,188,159, Cl. 405-282.000.

Clarke, David E.; Davies, James F.; and Tune, John B., to Lever Brothers Company. Detergent composition in a water-insoluble bag having a water-sensitive seal. 4,188,304, Cl. 252-93.000.

Clarke, Stanley W.; and Clarke, Angus J. Maintaining the shape of holes. 4,188,159, Cl. 405-282.000.

Clemens, Kurt; and Klein, Hans, deceased (by Frielingsdorf, Maria Klein nee, heir), to L. & C. Steinmuller GmbH. Welded joint. 4,188,140, Cl. 403-13.000.

Clesa S.p.A.: *See—*
Portelli, Mario; DellaBella, Davide; Cervato, Giuseppe; and Marca, Gianfranco, 4,188,402, Cl. 424-324.000.

Cobble, James T., to B & J Machinery Company, Inc. Tufting machine. 4,187,788, Cl. 112-79.00R.

Cochran, Donald D., to Packaging Systems, Inc. Apparatus for removing pressure sensitive tape from containers. 4,187,662, Cl. 53-381.00A.

Coe, Thomas D.: *See—*
Lavochkin, Ronald B.; and Coe, Thomas D., 4,187,711, Cl. 72-256.000.

Coffield, Harold M. Potato chip cooking apparatus. 4,187,770, Cl. 99-353.000.

Cohen, Jerome H., to Burtest Products Corp. Pads for bucks of garment pressing machines. 4,187,627, Cl. 38-66.000.

Cohen, Leon H. Shoe innersole. 4,187,621, Cl. 36-44.000.

Cohn, Charles C. Treatment of cigarette paper. 4,187,862, Cl. 131-15.00R.

Cohn, Robert, to Champion International Corporation. Method for applying sealing material to envelopes. 4,188,414, Cl. 427-45.100.

Coleman, Robert A.; and Beard, Larry D. Flat plate solar heat collector. 4,187,901, Cl. 165-47.000.

Colgate-Palmolive Company: *See—*
Dillarstone, Alan; Lowe, Norman; and Cropper, Edwin, 4,188,306, Cl. 252-121.000.
Gaffar, Abdul, 4,188,372, Cl. 424-54.000.
Temin, Samuel C., 4,188,317, Cl. 260-42.530.

Collins, Amilcare; Soverini, Arrigo; and Rosati, Francesco, to Montedison S.p.A. Process for polymerizing ethylene in a gaseous phase. 4,188,470, Cl. 526-64.000.

Collins, Robert. Back wash-massage-scrubber. 4,187,575, Cl. 15-222.000.

Collins, Vernon K.: *See—*
Melby, William E.; Isdale, Charles E., Sr.; and Collins, Vernon K., 4,188,467, Cl. 435-274.000.

Collo GmbH: *See—*
Ehlenz, Peter, 4,188,447, Cl. 428-310.000.

Combustion Engineering, Inc.: *See—*
Ladwig, Richard D., 4,188,186, Cl. 432-43.000.
Lang, Heinrich, 4,187,876, Cl. 137-594.000.

Commercial Shearing Inc.: *See—*
Hodgson, Robert F.; and Petro, John D., 4,187,877, Cl. 137-596.000.

Commissariat a l'Energie Atomique: *See—*
Abbes, Claude; Gournier, Andre; Rouaud, Christian; and de Villepoix, Raymond, 4,188,037, Cl. 277-2.000.
Boisde, Gilbert; and Boissier, Alain, 4,188,126, Cl. 356-440.000.

Commonwealth Scientific Corporation: *See—*
Monk, Gaines W., 4,187,801, Cl. 118-729.000.

Commonwealth Scientific and Industrial Research Organization: *See—*
Mamers, Heikki; and Rowney, John E., 4,188,259, Cl. 162-4.000.
Swingler, Donald L., 4,188,560, Cl. 313-105.00R.

Compagnie Francaise des Petroles: *See—*
Buresi, Georges; and Grappe, Rene G., 4,188,084, Cl. 339-117.00R.
Duval, Jean J., 4,187,625, Cl. 37-71.000.

Compagnie Generale de Radiologie: *See—*
Carville, Charles; and Laffitte, Andre, 4,188,559, Cl. 313-60.000.

Compagnie Internationale pour l'Informatique: *See—*
Delorme, M. Raymond, 4,187,730, Cl. 74-54.000.
Lamare, Jean-Claude; and Maury, Christian, 4,188,620, Cl. 340-347.0DD.

Compen, Johannes M. A. A.: *See—*
Zegers, Antonius P. F.; and Compen, Johannes M. A. A., 4,188,564, Cl. 313-479.000.

Connolly, Joseph C. Electrical fuel cut off switch. 4,187,824, Cl. 123-198.00F.

Conrad, William A.: *See—*
Hansen, Lee A.; and Conrad, William A., 4,187,577, Cl. 15-328.000.

Constantinescu, Spiridon. Vacuum system for swimming pools. 4,187,654, Cl. 52-169.700.

Continental Group, Inc., The: *See—*
Goth, Carl W., 4,187,985, Cl. 239-337.000.
Klootwyk, Ronald I., 4,188,462, Cl. 429-68.000.
Mascia, Carmen T., 4,187,963, Cl. 222-402.130.
Pelton, Peter G., 4,187,959, Cl. 222-94.000.

Cook, George E.: *See—*
Merrick, George J.; Cook, George E.; and Modglin, Donald D., 4,188,525, Cl. 219-125.120.

Cook, Stephen O., to Crown Zellerbach Corporation. Flexible packaging films of high density polyethylene capable of forming easily openable heatseals. 4,188,441, Cl. 428-216.000.

Cooper Laboratories, Inc.: *See—*
Krezanoski, Joseph Z., 4,188,373, Cl. 424-78.000.

Copal Company Limited: *See—*
Yamazaki, Masao, 4,188,138, Cl. 400-586.000.

Corbett, Wendell E.; and Sutton, Jay D. Feed residue saver for combines. 4,188,160, Cl. 406-58.000.

Cornelius, Archie J.; and Needham, Riley B., to Phillips Petroleum Company. CO_2 removal from hydrocarbon gas in water bearing underground reservoir. 4,187,910, Cl. 166-305.00R.

Corning Glass Works: *See—*
Weetall, Howard H., 4,188,371, Cl. 424-1.000.

Corrigan, Francis R., to General Electric Company. Direct conversion process for making cubic boron nitride from pyrolytic boron nitride. 4,188,194, Cl. 51-307.000.

Corrugated Development, Inc.: *See*—
Kirkpatrick, Alan D., 4,188,257, Cl. 156-504.000.

Cosarnia Limited: *See*—
Barnacle, Leslie J. H., 4,187,751, Cl. 83-458.000.

Cotton, Frank A.: *See*—
Kaplan, Leonard; and Cotton, Frank A., 4,188,335, Cl. 260-449.00L.

Coulter Electronics, Inc.: *See*—
Brunsting, Albert; and Hogg, Walter R., 4,188,543, Cl. 250-458.000.
Hogg, Walter R.; and Brunsting, Albert, 4,188,542, Cl. 250-458.000.

Cousse, Henri: *See*—
Pitet, Guy; Cousse, Henri; Mouzin, Gilbert; and Stenger, Antoine, 4,188,387, Cl. 424-249.000.

Cox, Myron K.; McGrath, William J.; and Cantrill, James E., to Wright State University. Surface friction tester. 4,187,714, Cl. 73-9.000.

Coyle, Forrest E.: *See*—
Patel, Jayant M.; Wolfe, Jerome K.; and Coyle, Forrest E., 4,188,516, Cl. 200-48.00R.

Cramer, Robert L. Method and apparatus for pumping fluids from bore holes. 4,187,912, Cl. 166-314.000.

Craven, John; and Reilly, Thomas H. M., to Lucas Industries Limited. Liquid fuel pumping apparatus. 4,187,822, Cl. 123-179.00L.

Crean, John C.; and Stroppe, Bill, to Fleetwood Enterprises, Inc. Trailer suspension. 4,188,047, Cl. 280-678.000.

Creasey, Leon D. Fireplace insert. 4,187,830, Cl. 126-121.000.

Crofford, Jimmie: *See*—
Holmes, Billy G.; and Crofford, Jimmie, 4,188,068, Cl. 299-5.000.

Crompton & Knowles Corporation: *See*—
Cyvas, Petras, 4,187,887, Cl. 139-196.200.

Cronson, Harry M.; Rao, Basrur R.; and Ross, Gerald F., to Sperry Corporation. Shielded surface wave transmission line. 4,188,595, Cl. 333-113.000.

Cropper, Edwin: *See*—
Dillarstone, Alan; Lowe, Norman; and Cropper, Edwin, 4,188,306, Cl. 252-121.000.

Crown Zellerbach Corporation: *See*—
Cook, Stephen O., 4,188,441, Cl. 428-216.000.

Crowther, Curt P. Waterbed. 4,187,567, Cl. 5-451.000.

Crystal Systems, Inc.: *See*—
Schmid, Frederick, 4,187,828, Cl. 125-18.000.

Cue, Berkeley W.: *See*—
Gassman, Paul G.; and Cue, Berkeley W., 4,188,325, Cl. 260-325.00R.

Cuilleron, Jean. Milling cutter with inset cutting blades. 4,188,161, Cl. 407-25.000.

Cullis, Herbert M.; Dorsey, Evelyn E.; and De Vries, James H., to Baxter Travenol Laboratories, Inc. Method and system for fractionating a quantity of blood into the components thereof. 4,187,979, Cl. 233-14.00R.

Cummins Engine Company, Inc.: *See*—
Wilson, Harry L.; Shultz, David E.; and Muntean, George L., 4,187,817, Cl. 123-139.0AW.

Curtiss-Wright Corporation: *See*—
Loyd, Robert W., Jr., 4,187,825, Cl. 123-205.000.

Cutter Laboratories, Inc.: *See*—
Dahlen, Burton L.; and Stubstad, James A., 4,187,558, Cl. 3-1.000.

Cyr, Leonide A. Scaffold stabilizer. 4,187,929, Cl. 182-222.000.

Cyvas, Petras, to Crompton & Knowles Corporation. Loom projectile. 4,187,887, Cl. 139-196.200.

Czajkowski, George J.; and Stolfa, Frank, to UOP Inc. Startup method for a moving-bed hydrogenation zone. 4,188,283, Cl. 208-143.000.

D. Swarovski & Co, Glasschleiferei: *See*—
Schwab, Kurt, 4,188,256, Cl. 156-386.000.

Dahlen, Burton L.; and Stubstad, James A., to Cutter Laboratories, Inc. Prosthetic ligament. 4,187,558, Cl. 3-1.000.

Daido Metal Company Ltd.: *See*—
Mori, Sanae, 4,188,079, Cl. 308-237.00R.

Daiichikasei Co., Ltd.: *See*—
Matsuura, Katsuji; and Arai, Kunihito, 4,188,421, Cl. 427-385.00A.

Daikin Kogyo Co., Ltd.: *See*—
Suzuki, Takeshi; Furukawa, Yasuyoshi; Tomoda, Masayasu; and Ueta, Yutaka, 4,188,352, Cl. 525-187.000.

Daimler-Benz Aktiengesellschaft: *See*—
Bauer, Wilhelm; Heinrich, Kurt; Klie, Wolfgang; Rau, Wolfgang; and Trost, Werner, 4,188,059, Cl. 296-188.000.

DallaPiazza, Dennis G., to General Electric Company. Dental x-ray apparatus. 4,188,536, Cl. 250-402.000.

Dalmasso, Claudio: *See*—
Pasini, Arnaldo; Dalmasso, Claudio; Brescia, Riccardo; and Bosio, Roberto, 4,188,139, Cl. 400-696.000.

Dalziel, David G. Air rescue net. 4,188,000, Cl. 244-137.00P.

Dan-Mar Co. Inc.: *See*—
Heckelman, James D.; and Ziemke, Robert A., 4,188,621, Cl. 340-528.000.

Dan River Inc.: *See*—
Norton, Charlie L., 4,187,795, Cl. 112-318.000.

Dana Corporation: *See*—
Ratliff, William K.; and Warman, Charles P., 4,187,940, Cl. 192-88.00A.

Danilewicz, John C.: *See*—
Campbell, Simon F.; Danilewicz, John C.; Ham, Allan L.; and Stubbs, John K., 4,188,391, Cl. 424-251.000.

Dannatt, Hugh St. L., to SCM Corporation. Low silhouette keyboard. 4,188,137, Cl. 400-496.000.

Darrah, Edward R.: *See*—
Sordello, Frank J.; Darrah, Edward R.; and Touchton, James J., 4,188,646, Cl. 360-77.000.

Dassler, Armin A., to PUMA-Sportschuhfabriken Rudolf Dassler KG. Athletic shoe. 4,187,623, Cl. 36-129.000.

Data Recording Instrument Company Limited: *See*—
Ridgway, Peter C.; and Case, Derek F., 4,188,247, Cl. 156-154.000.

Daum, Werner: *See*—
Brandes, Wilhelm; and Daum, Werner, 4,188,401, Cl. 424-304.000.

D'Auria, Luigi; Jacques, Andre; and Malsot, Christian, to Thomson-CSF. Optical fibre positioning ferrule and connector comprising such a ferrule. 4,188,087, Cl. 350-96.200.

Davenport, Richard G., to Caterpillar Tractor Co. Winch assembly with anti-fallback clutch. 4,187,936, Cl. 192-21.000.

Davies, James F.: *See*—
Clarke, David E.; Davies, James F.; and Tune, John B., 4,188,304, Cl. 252-93.000.

Davy International (Oil and Chemicals) Limited: *See*—
Rowden, George A., 4,188,361, Cl. 423-9.000.

Day, Christopher C.; and McEachern, Robert A., to American Optical Corporation. Method and apparatus for orienting the display of information from a recirculating memory. 4,187,858, Cl. 128-710.000.

Dayco Corporation: *See*—
Holden, Homer N.; and Gaster, Ivan, 4,188,081, Cl. 339-15.000.

Dayton-Walther Corporation: *See*—
Walther, William D.; and Phillips, Charles E., 4,187,733, Cl. 74-342.000.

DeBernard, Lewis M., Jr.; and Mercer, Donald G., to Allied Chemical Corporation. Multilevel colorway carpet system. 4,188,430, Cl. 428-88.000.

Deckman, Harry W.; and Halpern, Gerald M., to University of Rochester, The. Method for the non-destructive assaying of laser fusion targets. 4,188,532, Cl. 250-336.000.

Deere & Company: *See*—
Baker, Keith R., 4,187,720, Cl. 73-119.00A.
Stecklein, Gary L., 4,188,146, Cl. 403-158.000.

de Haan, Maarten R., to U.S. Philips Corporation. Color television signal having color-difference signals alternating between two carriers. 4,188,638, Cl. 358-4.000.

Deibel, Raymond A.; Gowans, Neil A.; and Riester, William C., to Trico Products Corporation. Wiper blade. 4,187,576, Cl. 15-250.420.

Deissler, Robert J. Method and apparatus for sound production. 4,187,635, Cl. 46-174.000.

Dejean, Pierre: *See*—
Barge, Jean; Catte, Raymond; Chapelet, Gilbert; Bui, Ai; Dejean, Pierre; Huraux, Claude; and Mayoux, Christian, 4,188,303, Cl. 252-63.700.

Delap, Joseph A.: *See*—
Nasser, Benny E., Jr.; and Delap, Joseph A., 4,188,471, Cl. 526-96.000.

DellaBella, Davide: *See*—
Portelli, Mario; DellaBella, Davide; Cervato, Giuseppe; and Marca, Gianfranco, 4,188,402, Cl. 424-324.000.

Della Torre, Giancarlo: *See*—
Fietta, Emilio; and Della Torre, Giancarlo, 4,187,793, Cl. 112-288.000.

Delorme, M. Raymond, to Compagnie Internationale pour l'Informatique. Lever control arrangement for controlling the movement of an oscillating lever. 4,187,730, Cl. 74-54.000.

Del Rio, Carlos M.: *See*—
Cannom, David L.; and Del Rio, Carlos M., 4,188,607, Cl. 338-224.000.

Del Soldato, Piero: *See*—
Pestellini, Vittorio; Ghelardoni, Mario; Bianchini, Claudio; Del Soldato, Piero; Volterra, Giovanna; and Meli, Alberto, 4,188,323, Cl. 548-229.000.

DeLuca, Hector F.; Schnoes, Heinrich K.; Napoli, Joseph L., Jr.; and Onisko, Bruce L., to Wisconsin Alumni Research Foundation. Fluorovitamin D compounds and processes for their preparation. 4,188,345, Cl. 568-665.000.

Del Valle, Leon. Device for reconstituting used coffee grounds. 4,187,992, Cl. 241-65.000.

Demole, Edouard: *See*—
Kovats, Ervin; Demole, Edouard; Ohloff, Gunther; and Stoll, Max, deceased, 4,187,863, Cl. 131-17.00R.

DeMoss, Dean: *See*—
Ragle, Herbert U.; and DeMoss, Dean, 4,188,645, Cl. 360-75.000.

Dempsey, Leonard H.; and Adrian, Linda S. Skill board game. 4,188,034, Cl. 273-248.000.

Dennison Manufacturing Company: *See*—
Amberkar, Suresh D.; Hansen, Elwood F.; and Hansen, David E., 4,188,197, Cl. 55-382.000.

Deschamps, Bernard: *See*—
Chielens, Alain; Deschamps, Bernard; and Marchal, Gerard, 4,188,077, Cl. 308-135.000.

Deschamps, Joseph P., to International Harvester Company. Rotary mower belt drive. 4,187,924, Cl. 180-53.00R.

DeShon, Wallace E., to Phillips Petroleum Company. I/O Terminal identification. 4,188,664, Cl. 364-200.000.

De Simone, David N., to United States of America, Navy. Ship escape and survival system. 4,187,570, Cl. 9-14.000.

Detert, Klaus; Bertram, Wolfgang; and Fischdick, Hermann, to Licentia Patent-Verwaltungs-G.m.b.H. Method for preventing cracks below seams during plating and welding. 4,188,419, Cl. 427-287.000.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
Volker, Herbert; Koberstein, Edgar; Bozon, Alfred; and Hensel, Jorg, 4,188,309, Cl. 252-466.00J.

de Villepoix, Raymond: *See*—
Abbes, Claude; Gournier, Andre; Rouaud, Christian; and de Villepoix, Raymond, 4,188,037, Cl. 277-2.000.

De Vries, James H.: *See*—
Cullis, Herbert M.; Dorsey, Evelyn E.; and De Vries, James H., 4,187,979, Cl. 233-14.00R.

Dezawa, Katsumi: *See*—
Tsukamoto, Goro; Yoshino, Koichiro; Kohno, Toshihiko; Taguchi, Masahiro; Dezawa, Katsumi; Kagaya, Hajime; Ito, Keiso; and Nose, Takashi, 4,188,486, Cl. 546-271.000.

Diamant Boart: *See*—
Lambot, Honore J., 4,187,919, Cl. 175-246.000.

Dickey, Donald F., to Superior Cable Corporation. Telephone wall jack. 4,188,082, Cl. 339-36.000.

Dickey, Fred M.: *See*—
Ashenfelter, Ernest W.; Dickey, Fred M.; and White, Jerry R., 4,188,533, Cl. 250-338.000.

Dictaphone Corporation: *See*—
Meri, Kalju; and Allen, Richard G., 4,188,507, Cl. 179-6.00D.

Diehl, Pieter S., to Orr Felt Company, The. Papermakers' felt. 4,187,618, Cl. 34-243.00F.

Diehl, Werner K.: *See*—
Schrawer, Rolf; Diehl, Werner K.; and Ringelstein, Hans M., 4,187,956, Cl. 220-465.000.

Diels, Jean-Claude, to University of Southern California. Efficient particle excitation. 4,188,538, Cl. 250-423.00P.

Dietiker, Paul: *See*—
Battersby, Robert J.; and Dietiker, Paul, 4,188,013, Cl. 251-175.000.

Di'Giorgio, Anthony D.: *See*—
Pagano, Carmine N.; and Di'Giorgio, Anthony D., 4,188,503, Cl. 178-88.000.

Digital Products Corporation: *See*—
Bower, David S.; and Smith, Fred J., 4,188,510, Cl. 179-90.0BD.

Dijkstra, Rinse; van den Broek, Arnoldus J. M.; and Lippits, Gerardus J. M., to U.S. Philips Corporation. Record carrier in disk form having cover layers. 4,188,433, Cl. 428-64.000.

Dillarstone, Alan; Lowe, Norman; and Cropper, Edwin, to Colgate-Palmolive Company. Pumpable soap. 4,188,306, Cl. 252-121.000.

Dills, Raymond L., to General Electric Company. Effective concurrent microwave heating and electrical resistance heating in a countertop microwave oven. 4,188,520, Cl. 219-10.55B.

DiLoreto, Lohret J. Meatball machine. 4,187,582, Cl. 17-32.000.

Dingler, Gerhard. Tensioning device for frame pieces. 4,188,017, Cl. 254-51.000.

Dingwall, Andrew G. F., to RCA Corporation. Circuitry with unbalanced long-tailed-pair connections of FET's. 4,188,588, Cl. 330-253.000.

Distillers Company (Yeast) Limited, The: *See*—
Grylls, Frederick S. M.; Rennie, Stanley D.; and Kelly, Michael, 4,188,407, Cl. 426-62.000.

Dittrich, Jurgen; Heinzerling, Jurgen; Meijer, Dietrich E.; Mollendorf, Ralf; and Wolf, Friedrich, to U.S. Philips Corporation. Apparatus for making laminar radiograms. 4,188,640, Cl. 358-111.000.

Dr. Ing. h.c. F. Porsche Aktiengesellschaft: *See*—
Zebli, Roland-Detlev, 4,187,821, Cl. 123-179.00G.

Doerer, Richard P., to Van Dresser Corporation. Self-supporting automotive liner panel. 4,188,440, Cl. 428-215.000.

Doi, Toshitada: *See*—
Kazami, Shin-Ichi; and Doi, Toshitada, 4,188,616, Cl. 340-146.1AL.

Dolkemeyer, Wilfried: *See*—
Fell, Bernard; and Dolkemeyer, Wilfried, 4,188,363, Cl. 423-22.000.

Donan, David C., Jr.; and Donan, David M., to Waiamea Company, Inc. Mine roof bolt hole seal. 4,188,158, Cl. 405-259.000.

Donan, David M.: *See*—
Donan, David C., Jr.; and Donan, David M., 4,188,158, Cl. 405-259.000.

Dorais, Mark V., to Federal Screw Works. Acoustically responsive sensor switch. 4,188,549, Cl. 307-308.000.

Dorling, Rolf, to L. & C. Steinmuller GmbH. Armored pipe connected to a steel lining of a prestressed cast pressure tank. 4,187,955, Cl. 220-435.000.

Dornfeld, John E.; and Joyner, Bobby L., to Sprague Electric Company. Ceramic capacitor with surface electrodes. 4,188,651, Cl. 361-322.000.

Dorsey, Evelyn E.: *See*—
Cullis, Herbert M.; Dorsey, Evelyn E.; and De Vries, James H., 4,187,979, Cl. 233-14.00R.

Dougherty, Richard H.; and Fealy, Thomas E., to United States of America, Navy. Linkage apparatus for synchronizing aircraft door movements with the deployment of a door-enclosed antenna. 4,188,631, Cl. 343-705.000.

Dow Chemical Company, The: *See*—
Giacobbe, Thomas J.; and White, Halbert C., 4,188,330, Cl. 260-343.30R.
Hickner, Richard A.; and Farber, Hugh A., 4,188,340, Cl. 260-567.60P.
Larsen, Eric R.; and McCarty, Leslie P., 4,188,405, Cl. 424-342.000.
Markley, Lowell D., 4,188,346, Cl. 260-651.00F.
Nelson, Donald L., 4,188,473, Cl. 528-86.000.

Dowker, Raymond A. Mailbox protective apparatus. 4,187,978, Cl. 232-39.000.

Dragerwerk Aktiengesellschaft: *See*—
Warncke, Ernst; and Pasternack, Adalbert, 4,187,843, Cl. 128-202.260.

Dragunevicius, Algirdas J.: *See*—
Morrell, Ronald J.; Gumb, Beverley W.; and Dragunevicius, Algirdas J., 4,188,513, Cl. 179-111.00E.

Draiswerke GmbH: *See*—
Engels, Kaspar, 4,188,130, Cl. 366-228.000.

Dresser Industries, Inc.: *See*—
Fertl, Walter H.; and Vaello, Donald B., 4,187,908, Cl. 166-254.000.
Phelps, Francis E., 4,187,922, Cl. 175-374.000.

Dror, Leon L. Apparatus for feeding anesthetic and/or life sustaining gases during a surgical procedure. 4,187,845, Cl. 128-205.130.

Duarte, Jesus: *See*—
Bomar, Richard L.; and Duarte, Jesus, 4,188,606, Cl. 338-137.000.

Dubrowski, John. Ear clip for flattening of protruding ears. 4,187,838, Cl. 128-76.00R.

Dubs, Paul; and Kuntzel, Heiner, to Givaudan Corporation. Odorant and/or flavoring disulphides, compositions containing same and process for making same. 4,188,488, Cl. 548-337.000.

Ducret, Jacques; Gaulliard, Jean-Michel; and Vial, Jean, to Philagro. Fungicides hydrazinium phosphites. 4,188,381, Cl. 424-199.000.

Dudinyak, Ronald S., to Du Pont de Nemours, E. I., and Company. Process and composition for polymerizing and curing methyl methacrylate monomer-polymer syrups in the presence of metal salts of hemi-peresters of maleic acid. 4,188,315, Cl. 260-40.00R.

Duguet, Jean-Claude, to Agence Nationale de Valorisation de la Recherche (ANVAR). Self-scraping mixers. 4,188,131, Cl. 366-301.000.

Dunlop Limited: *See*—
Finney, Geoffrey L., 4,187,835, Cl. 126-360.00R.

Dunn, Robert J.; and Martinez, Sigifred. Combination musical instrument stand. 4,187,947, Cl. 211-13.000.

Du Pont de Nemours, E. I., and Company: *See*—
Dudinyak, Ronald S., 4,188,315, Cl. 260-40.00R.
Fang, James C., 4,188,469, Cl. 526-18.000.
Irwin, Robert S., 4,188,476, Cl. 528-190.000.
Lyons, Thomas B., 4,187,994, Cl. 242-35.50R.

Durango Systems, Inc.: *See*—
Waibel, Helmut K., 4,188,148, Cl. 403-258.000.

Durst AG Fabrik Fototechnischer Apparate: *See*—
Barbieri, Siegfried; and Kapfinger, Wolfgang, 4,188,125, Cl. 356-404.000.

Dusart, Etienne R. Hammock chair with back supporting means. 4,188,063, Cl. 297-273.000.

du Temple de Rougemont, Christian, to Isostat. Miniature electrical push button contactor. 4,188,518, Cl. 200-159.00R.

Duval, Jean J., to Compagnie Francaise des Petroles. System for excavation at sea through horizontal guiding by means of cables. 4,187,625, Cl. 37-71.000.

Dymo Industries, Inc.: *See*—
Holland-Letz, Gunter, 4,187,778, Cl. 101-291.000.

Dynamit Nobel Aktiengesellschaft: *See*—
Hulsmann, Hans-Leo; and Renckhoff, Gustav, deceased, 4,188,263, Cl. 439-179.000.

E.T.I. Corporation: *See*—
Murphy, Wesley T., 4,188,147, Cl. 403-230.000.

Eagan, Joseph A., Sr. Farm pump mounting bracket. 4,188,008, Cl. 248-544.000.

Eakins, Kenneth E.; and Bhattacherjee, Parimal, to Nelson Research & Development Company. Ophthalmic composition and method of use. 4,188,394, Cl. 424-262.000.

Eastman Kodak Company: *See*—
Cawley, John D., 4,188,219, Cl. 430-208.000.
Gusfafson, Gary B.; and Staub, Martin L., 4,188,025, Cl. 271-314.000.
Gysling, Henry J., 4,188,218, Cl. 430-495.000.
Harvey, Donald M., 4,188,106, Cl. 354-330.000.
Lu, Chen-i; Krall, Harry J.; and Osmers, Herman R., 4,188,449, Cl. 428-314.000.
Moring, James M., 4,188,272, Cl. 204-149.000.
Wilkes, Glenn R.; and Brault, Albert T., 4,188,217, Cl. 430-353.000.

Eaton Corporation: *See*—
Smith, Charles R., 4,187,684, Cl. 60-531.000.

Ebauches Electroniques S.A.: *See*—
Fatton, Jean-Claude, 4,187,671, Cl. 58-152.00B.

Echlin Manufacturing Company, The: *See*—
Sinko, Michael J.; and Velinsky, Milton, 4,187,981, Cl. 235-488.000.

Eckel, Hans-Joachim: *See*—
Humpert, Jurgen; Eckel, Hans-Joachim; and Behrenberg, Rolf, 4,187,880, Cl. 137-625.170.

Eckles, William E.; Ferguson, Wilfred J.; and Willis, William J., to Rohco, Inc. Alkaline zinc electroplating baths and additive compositions therefor. 4,188,271, Cl. 204-55.00R.

Edelman, Alfred E. Submerged functional implant and method. 4,187,609, Cl. 433-176.000.

Edwards, Charles M.; and Walter, William C., to United Geophysical Corporation. Seismic prospecting system. 4,188,611, Cl. 367-41.000.

Edwards, Gerald L.: *See*—
Smith, Maurice I.; Gillen, John D.; and Edwards, Gerald L., 4,188,511, Cl. 179-99.00A.

Edwards, John A., to Syntex (U.S.A.) Inc. Thioetianic acid derivatives. 4,188,385, Cl. 424-241.000.

Edwards, Roderick I.; Loo, Joe P.; and Ossin, David I., to National Institute for Metallurgy. Process for the treatment of platinum group metals and gold. 4,188,362, Cl. 423-22.000.
Edwin Cooper and Company Limited: *See*—
Jayne, Gerald J. J.; and Woods, David R., 4,188,297, Cl. 252-45.000.
Egami, Tsuneyuki, to Nippon Soken, Inc. Demodulator circuit for chopper amplifier. 4,188,586, Cl. 329-192.000.
Ehlenz, Peter, to Collo GmbH. Polymeric foam cleaning product. 4,188,447, Cl. 428-310.000.
Ehrlich, Sol. Hanging plant elevator. 4,187,996, Cl. 242-107.40R.
Eisenberg, Sylvan, to Microtracers Inc. Protected iron tracer composition and method of making. 4,188,408, Cl. 426-74.000.
Electric Power Research Institute, Inc.: *See*—
Arcuri, Joseph D., Jr., 4,188,463, Cl. 429-104.000.
Elliott Brothers (London) Limited: *See*—
Alexander, Alfred J.; Jibb, David J.; and Hollaway, Graham, 4,188,627, Cl. 340-747.000.
Ellis, Stafford M., 4,188,090, Cl. 350-174.000.
Ellis, Peter M.; and Selwood, Alan, to Imperial Chemical Industries Limited. Non woven fabrics with pattern of discrete fused areas. 4,188,436, Cl. 428-198.000.
Ellis, Stafford M., to Elliott Brothers (London) Limited. Retractable head-up displays. 4,188,090, Cl. 350-174.000.
Elmer, Steven A. Knock-down chair. 4,188,067, Cl. 297-442.000.
Emerson Electric Co.: *See*—
Rippelmeyer, Dennis M.; and Baysinger, Robert L., 4,188,181, Cl. 431-66.000.
EMI Limited: *See*—
Hounsfield, Godfrey N., 4,188,541, Cl. 250-445.00T.
Endo, Yoshihiro: *See*—
Mizukami, Etsuo; Kishishita, Hiroshi; Kawaguchi, Masashi; Endo, Yoshihiro; and Isaka, Kinichi, 4,188,565, Cl. 313-509.000.
Engelhardt, Achim: *See*—
Grell, Helmut; and Engelhardt, Achim, 4,187,559, Cl. 3-1.910.
Engels, Kaspar, to Draiswerke GmbH. Device for continuously mixing wood chips with binder. 4,188,130, Cl. 366-228.000.
Engl, Robert; and Richter, Hans, to Meggle Milchindustrie GmbH & Co. KG. Compositions containing thiocyanic acid and hexamethylene-tetramine, production process and administration thereof as bactericide and mycocide. 4,188,386, Cl. 424-249.000.
Ensign-Bickford Company: *See*—
Petruccelli, Guy S., 4,187,780, Cl. 102-28.00R.
Enterprise Machine and Development Corporation: *See*—
Price, Samuel T., 4,187,593, Cl. 28-254.000.
Erbstoesser, Steven R., to Exxon Production Research Company. Method and apparatus for placing buoyant ball sealers. 4,187,909, Cl. 166-284.000.
Erco Envirotech Ltd.: *See*—
Rowlandson, Gordon; Reeve, Douglas W.; and Rapson, W. Howard, 4,188,260, Cl. 162-16.000.
Erco Industries Limited: *See*—
McGilvery, James D., 4,188,367, Cl. 423-322.000.
Eriksson, Lars A.: *See*—
Johnsson, Mans K. O.; and Eriksson, Lars A., 4,188,206, Cl. 75-60.000.
Erlichman, Irving, to Polaroid Corporation. Battery containing film cassette wherein removal of last sheet insulates contacts. 4,188,105, Cl. 354-202.000.
Ernst Leitz Wetzlar GmbH: *See*—
Schaefer, Klaus-Dieter, 4,188,102, Cl. 354-25.000.
Schenck, Karl-Wilhelm; Nissel, Gunthard; and Schuster, Erich, 4,188,119, Cl. 356-252.000.
ESCO Corporation: *See*—
Greer, Donald J.; and MacEwan, John D., Jr., 4,187,626, Cl. 37-141.00R.
Escott, Robert M.: *See*—
Beggs, Donald; and Escott, Robert M., 4,188,022, Cl. 266-195.000.
Espenscheid, Wilton F.; and Yan, Tsoung-Yuan, to Mobil Oil Corporation. Electrode binder composition. 4,188,235, Cl. 106-278.000.
Ess, John O., to United States of America, Navy. Specific gravity equalizer system. 4,187,796, Cl. 114-312.000.
Essebaggers, Jan, to B.V. Neratoom. Fluid diode. 4,187,874, Cl. 137-533.110.
Etablissement Dentaire Ivoclar: *See*—
Hugelshofer, Max, 4,187,984, Cl. 239-13.000.
Ethyl Corporation: *See*—
Walter, Thomas J., 4,188,493, Cl. 562-580.000.
Walter, Thomas J.; and Laurent, Sebastian M., 4,188,499, Cl. 568-914.000.
Etoh, Kuniomi: *See*—
Nanpei, Masaru; Fujimura, Toshiaki; Kouda, Hajime; Kasho, Yoshihiro; and Etoh, Kuniomi, 4,188,221, Cl. 430-288.000.
Eubank, Marcus P. Self contained solar heating supplemental unit. 4,187,831, Cl. 126-419.000.
Evans, Richard F. Automatic machine tool. 4,187,748, Cl. 82-2.500.
Ex-Cell-O Corporation: *See*—
Fitzpatrick, Paul, 4,187,644, Cl. 51-34.00D.
Exxon Production Research Company: *See*—
Erbstoesser, Steven R., 4,187,909, Cl. 166-284.000.
Exxon Research & Engineering Co.: *See*—
Bosniack, David S.; and Korbach, Paul F., 4,188,500, Cl. 585-1.000.
Chung, Chan I., 4,188,351, Cl. 260-33.6AQ.
Oswald, Alexis A., 4,188,380, Cl. 424-198.000.
Eysn, Manfred: *See*—
Patuzzi, Alexander; and Eysn, Manfred, 4,188,021, Cl. 266-88.000.
Ezra C. Lundahl, Inc: *See*—
Lundahl, Ezra C.; and Wiser, J. Gordon, 4,187,990, Cl. 241-30.000.
Facet Enterprises, Inc.: *See*—
Miller, Donald L., 4,187,938, Cl. 192-54.000.
Fachini, Robert M.: *See*—
McClure, Maxwell D., III; Lester, William D.; and Fachini, Robert M., 4,187,923, Cl. 180-215.000.
Falconbridge Nickel Mines Limited: *See*—
Norman, James L.; and Mayhall, Donald J., 4,188,204, Cl. 75-11.000.
Falomo, Lodovico. Device for clipping strips of photographic paper to developers comprising a flat conveyor belt. 4,188,108, Cl. 354-345.000.
Fandetti, Robert E.: *See*—
Calabrese, Richard A.; and Fandetti, Robert E., 4,187,933, Cl. 188-134.000.
Fang, James C., to Du Pont de Nemours, E. I., and Company. Composition of hydrophilic fluoropolymers with fibrous matter and liquid carrier. 4,188,469, Cl. 526-18.000.
Farber, Hugh A.: *See*—
Hickner, Richard A.; and Farber, Hugh A., 4,188,340, Cl. 260-567.60P.
Farge, Daniel; Leboul, Jean; Le Goff, Yves; and Poiget, Gilbert, to Philagro. Herbicidal and phytohormonal amidoximes. 4,188,203, Cl. 71-90.000.
Farley, James R.: *See*—
Patel, Jayant M.; and Farley, James R., 4,188,515, Cl. 200-48.00R.
Farmer, Robert F.: *See*—
Sokol, Phillip E.; and Farmer, Robert F., 4,188,431, Cl. 428-29.000.
Farmitalia Carlo Erba S.p.A.: *See*—
Suarato, Antonino; Masi, Paolo; Bernardi, Luigi; and Arcamone, Federico, 4,188,377, Cl. 424-180.000.
Fatton, Jean-Claude, to Ebauches Electroniques S.A. Electronic watch with reaction timer. 4,187,671, Cl. 58-152.00B.
Fauchier, Jess F.; Seipp, William H.; and Whiteside, Stephen E., to Gulf & Western Industries, Inc. System for converting analog signals to multiplexed digital data. 4,188,617, Cl. 340-183.000.
Faulkner, Bobby P.; and Moore, Donald C., to Allis-Chalmers Corporation. Slow speed wedge bar flotation mixing device. 4,188,287, Cl. 209-168.000.
Fealy, Thomas E.: *See*—
Dougherty, Richard H.; and Fealy, Thomas E., 4,188,631, Cl. 343-705.000.
Federal Screw Works: *See*—
Dorais, Mark V., 4,188,549, Cl. 307-308.000.
Feig, Stephen; and Vincent, William T., to Plascor Incorporated. Interlocking etagere system. 4,187,786, Cl. 108-64.000.
Felbeck, George T., Jr., to University of Rhode Island. Process for producing hydrocarbon gas from organic plant material. 4,188,193, Cl. 48-197.00R.
Felder, Louis; and Kirchmayr, Rudolf, to Ciba-Geigy Corporation. Photopolymerizable composition containing anthrones. 4,188,224, Cl. 204-159.150.
Fell, Bernard; and Dolkemeyer, Wilfried, to Bayer Aktiengesellschaft. Recovery of rhodium complex catalysts homogeneously dissolved in organic media. 4,188,363, Cl. 423-22.000.
Fellner, Georg. Quick chucking die holder device for forging presses. 4,187,713, Cl. 72-446.000.
Fergason, James L. Liquid crystal display having light indicia on a dark background. 4,188,094, Cl. 350-337.000.
Ferguson, Wilfred J.: *See*—
Eckles, William E.; Ferguson, Wilfred J.; and Willis, William J., 4,188,271, Cl. 204-55.00R.
Fermer, Karl-Erik; and Hulthe, Leif, to AB Svenska Flaktfabriken. Flow regulator. 4,187,879, Cl. 137-601.000.
Fernandez, Arthur A.; and Spector, George. Self propelled cable car. 4,187,784, Cl. 104-235.000.
Ferrini, Pier G.: *See*—
Haas, Georges; Rossi, Alberto; Ferrini, Pier G.; and Schier, Oswald, 4,188,396, Cl. 424-267.000.
Fertl, Walter H.; and Vaello, Donald B., to Dresser Industries, Inc. Method for ascertaining optimum location for well stimulation and/or perforation. 4,187,908, Cl. 166-254.000.
Fichet-Bauche French Body Corporation: *See*—
Guiraud, Francois, 4,187,705, Cl. 70-362.000.
Fields, Ellis K., to Standard Oil Company (Indiana). Process for trifluoromethylation of aromatic and heterocyclic compounds. 4,188,274, Cl. 204-158.0HA.
Fields, Ellis K., to Standard Oil Company (Indiana). Process for preparing beta-phosphosulfoxy alcohols. 4,188,275, Cl. 204-158.00R.
Fietta, Emilio; and Della Torre, Giancarlo, to Rockwell-Rimoldi, S.p.A. Automatic stitch cutting device. 4,187,793, Cl. 112-288.000.
Finlay, David E., to International Business Machines Corporation. Computer-controlled copier-printers. 4,188,668, Cl. 364-900.000.
Finney, Geoffrey L., to Dunlop Limited. Indirect heat transfer apparatus. 4,187,835, Cl. 126-360.00R.
Firmenich SA: *See*—
Kovats, Ervin; Demole, Edouard; Ohloff, Gunther; and Stoll, Max, deceased, 4,187,863, Cl. 131-17.00R.
Fischdick, Hermann: *See*—
Detert, Klaus; Bertram, Wolfgang; and Fischdick, Hermann, 4,188,419, Cl. 427-287.000.
Fischer, Hanspeter, to Ciba-Geigy Corporation. Process for the production of (substituted) 2,6-dimethylanilines. 4,188,341, Cl. 260-573.000.

Fischer, Klaus: *See*—
Wierzchowski, Dieter; Fischer, Klaus; Formanek, Gunther; and Scheumann, Leonhard, 4,188,528, Cl. 219-490.000.

Fischer, Roman; Fliege, Werner; Koernig, Wolfgang; and Meissner, Bernd, to BASF Aktiengesellschaft. Production of 4-(m,m'-ditert.-butyl-p-hydroxyphenyl)-butan-2-ones. 4,188,344, Cl. 260-590.00E.

Fisher, Edmund A.; and Schnitzer, Emanuel, to Cameron Iron Works, Inc. Riser. 4,188,156, Cl. 405-195.000.

Fisher, Eugene L.: *See*—
Johnson, Jesse R., 4,188,012, Cl. 251-173.000.

Fisons Limited: *See*—
Gillings, Christopher; Jewry, Ian C.; and Haynes, Harold G., 4,188,202, Cl. 71-88.000.

Fitzgibbons, William O., to Standard Oil Company. Inexpensive purification of urea waste streams. 4,188,292, Cl. 210-29.000.

Fitzpatrick, Paul, to Ex-Cell-O Corporation. Dual feed apparatus for multiple spindle honing machine. 4,187,644, Cl. 51-34.00D.

Fives-Cail Babcock: *See*—
Chielens, Alain; Deschamps, Bernard; and Marchal, Gerard, 4,188,077, Cl. 308-135.000.

Flanagan, Joseph E.; and Lo, George A., to Rockwell International Corporation. Caseless ammunition. 4,187,781, Cl. 102-38.0CC.

Fleckenstein, John. Ski and integral boot plate with toe piece and releasable heel binding. 4,188,046, Cl. 280-618.000.

Fleetwood Enterprises, Inc.: *See*—
Crean, John C.; and Stroppe, Bill, 4,188,047, Cl. 280-678.000.
Kliewer, Aron, Jr., 4,187,653, Cl. 52-98.000.

Flender, Hans F., to Trienekens, Matthias. Method of and device for treating heterogeneous waste. 4,187,775, Cl. 100-39.000.

Fless, Donald E., to Alchem, Inc. Fuel injection in blast furnaces. 4,188,205, Cl. 75-42.000.

Fliege, Werner: *See*—
Fischer, Roman; Fliege, Werner; Koernig, Wolfgang; and Meissner, Bernd, 4,188,344, Cl. 260-590.00E.

Flowers, Dervin L.; Greeson, Richard L.; and Rice, V. Louise, to Motorola, Inc. Semiconductor device having a tin metallization system and package containing same. 4,187,599, Cl. 29-588.000.

Flynn, Eugene R., to Manville Manufacturing Corporation. Liquid detergent reservoir. 4,187,875, Cl. 137-576.000.

FMC Corporation: *See*—
Kondo, Kiyoshi; and Matsui, Kiyohide, 4,188,492, Cl. 562-506.000.
Krisak, Edward J.; and Strozak, Stephen, 4,188,039, Cl. 277-95.000.
Lochte, Glen E., 4,188,050, Cl. 285-24.000.

Foley, Kevin M.; and Hill, Homer G., to Owens-Corning Fiberglas Corporation. Organo silane coupling agents overcoated on aluminum silicate coating on glass fibers. 4,188,454, Cl. 428-391.000.

Foley, Thomas P.: *See*—
Mosciatti, Roger; Foley, Thomas P.; and Moritz, Frederick G., 4,187,997, Cl. 242-182.000.

Follmer, William C., to Ford Motor Company. Automotive electric quick heat system. 4,188,527, Cl. 219-202.000.

Ford Motor Company: *See*—
Bregi, James F., 4,188,210, Cl. 75-130.00R.
Follmer, William C., 4,188,527, Cl. 219-202.000.
Haung, Bernard; and Rivin, Evgeny I., 4,188,048, Cl. 280-688.000.

Forman, Richard A. Method and apparatus for changing the concentration of molecules or atoms. 4,188,266, Cl. 204-1.00R.

Formanek, Gunther: *See*—
Wierzchowski, Dieter; Fischer, Klaus; Formanek, Gunther; and Scheumann, Leonhard, 4,188,528, Cl. 219-490.000.

Fornoni, Luigi. Continuous processes and equipment for treatment of solid substances. 4,188,184, Cl. 432-13.000.

Fortunato, Enrico, to Franco Tosi S.p.A. Device for inverting the direction of rotation of a driven shaft. 4,187,679, Cl. 60-331.000.

Fortune, William S. Desoldering system for use with a soldering instrument. 4,187,973, Cl. 228-20.000.

Foster, Leonard W.: *See*—
Olowinski, Edward J.; and Foster, Leonard W., 4,187,668, Cl. 57-130.000.

Fox, Daniel W.; and Rock, John A., to General Electric Company. Shaped article obtained from a carbonate-polyester composition. 4,188,314, Cl. 260-37.0PC.

Fox, David A., to Westinghouse Electric Corp. Multi-mode control logic circuit for solid state relays. 4,188,547, Cl. 307-239.000.

Fox, Robert Z. Multisport practice device. 4,188,031, Cl. 273-26.00A.

Fradin, David W.: *See*—
Buczek, Carl J.; Freiberg, Robert J.; Fradin, David W.; and Chenausky, Peter P., 4,188,592, Cl. 331-94.50G.

Franco Tosi S.p.A.: *See*—
Fortunato, Enrico, 4,187,679, Cl. 60-331.000.

Franke, Kurt, to Siemens Aktiengesellschaft. Dental apparatus for x-ray diagnosis. 4,188,537, Cl. 250-416.0TV.

Frantz, Gene A.; and Brantingham, George L., to Texas Instruments Incorporated. Method for scanning a keyboard and for actuating a display device via common conductors. 4,188,626, Cl. 340-711.000.

Frazita, Richard F., to Hazeltine Corporation. Phased array antenna with reduced phase quantization errors. 4,188,633, Cl. 343-854.000.

Freeman, Murray E.; and Shipper, Harmon E., to Tapco International, Inc. Control valve assembly. 4,187,872, Cl. 137-454.600.

Freiberg, Robert J.: *See*—
Buczek, Carl J.; Freiberg, Robert J.; Fradin, David W.; and Chenausky, Peter P., 4,188,592, Cl. 331-94.50G.

Freilev, Erik. Complete door set. 4,187,640, Cl. 49-380.000.

Frentzel, Kurt H., to Hunter Douglas International, N.V. Tilting connector for venetian blind slat ends. 4,187,897, Cl. 160-177.000.

Frey, Hellmuth: *See*—
Schmidhammer, Ludwig; and Frey, Hellmuth, 4,188,347, Cl. 260-652.00P.

Friedman, Leonard: *See*—
Pringle, William L., 4,187,777, Cl. 100-93.0PB.

Friedman, Norman J., to Johnson & Johnson. Paper having improved strength. 4,188,446, Cl. 428-288.000.

Frielingsdorf, Maria Klein nee, heir: *See*—
Clemens, Kurt; and Klein, Hans, deceased, 4,188,140, Cl. 403-13.000.

Frischmann, Albert; Mermi, Kurt; and Koniger, Rudolf, to Upat GmbH & Co. Arrangement for mounting an object to a support structure. 4,187,757, Cl. 85-80.000.

Fritz, Heinz P., to Rheinisch-Westfalisches Elektrizitatswerk AG. Method of making electrodes for electrolytic purposes. 4,188,269, Cl. 204-32.00R.

Fritzsche Dodge & Olcott Inc.: *See*—
Willis, Brian J.; and Yurecko, John M., Jr., 4,188,310, Cl. 252-522.00R.

Froning, H. Robert; Owens, William W.; and Archer, Duane L., to Standard Oil Company (Indiana). Waterflood method using surfactants. 4,187,907, Cl. 166-275.000.

Fuji Electric Co., Ltd.: *See*—
Watanabe, Atsuo; Ishizawa, Hidenori; and Uno, Masahiro, 4,188,534, Cl. 250-345.000.

Fuji Industry Co., Ltd.: *See*—
Kawai, Jun; Homma, Jun-ichi; Watanabe, Saburo; and Watanabe, Masahiro, 4,188,523, Cl. 219-83.000.

Fuji Kogyo Co., Ltd.: *See*—
Ohmura, Ryuichi, 4,187,633, Cl. 43-22.000.

Fuji Photo Film Co., Ltd.: *See*—
Fujiwara, Masato; Nirasawa, Mitsuharu; and Takeda, Keiji, 4,188,212, Cl. 430-69.000.
Iwasa, Masakazu; Kato, Hisashi; and Kudo, Yoshio, 4,187,774, Cl. 101-1.000.
Kasugai, Tsuneo; and Kitagawa, Keishi, 4,188,220, Cl. 430-536.000.
Kido, Keishiro; Yoshida, Satoshi; and Ikeda, Tomoaki, 4,188,214, Cl. 430-494.000.
Sato, Masamichi; Ikeda, Sadaharu; and Ikeda, Tomoaki, 4,188,215, Cl. 430-156.000.
Sugiyama, Masatoshi, 4,188,489, Cl. 548-360.000.

Fuji Seal Industry Co., Ltd.: *See*—
Fujio, Masaaki, 4,188,249, Cl. 156-165.000.

Fuji Xerox Co., Ltd.: *See*—
Hiraga, Michio, 4,188,113, Cl. 355-51.000.

Fujii, Kinjiro; Kondo, Wakichi; and Kumagai, Toshiya, to Agency of Industrial Science & Technology. Thermochemical method for producing hydrogen from water. 4,188,370, Cl. 423-579.000.

Fujii, Toru, to Olympus Optical Co., Ltd. Cata-dioptric objective lens system. 4,188,091, Cl. 350-201.000.

Fujimura, Toshiaki: *See*—
Nanpei, Masaru; Fujimura, Toshiaki; Kouda, Hajime; Kasho, Yoshihiro; and Etoh, Kuniomi, 4,188,221, Cl. 430-288.000.

Fujio, Masaaki, to Fuji Seal Industry Co., Ltd. Package including an elastic container protector and a method and machine for fitting the protector. 4,188,249, Cl. 156-165.000.

Fujishima, Hiroki: *See*—
Yamaguchi, Norishige; Ohya, Kazuo; Kohmoto, Osamu; and Fujishima, Hiroki, 4,188,211, Cl. 75-170.000.

Fujita, Etuo. Fuel combustion and magnetizing apparatus used therefor. 4,188,296, Cl. 210-222.000.

Fujitsu Limited: *See*—
Ishibashi, Masamichi, 4,188,662, Cl. 364-200.000.
Miwa, Hirohide; and Terakawa, Toshiaki, 4,188,566, Cl. 315-169.400.

Fujiwara, Masato; Nirasawa, Mitsuharu; and Takeda, Keiji, to Fuji Photo Film Co., Ltd. Electric current conductive composition, image recording element containing the same and process for recording images using the same. 4,188,212, Cl. 430-69.000.

Fukatsu, Shunzo: *See*—
Nakamura, Takeshi; Nakabayashi, Satoru; Fukatsu, Shunzo; and Seki, Shigeo, 4,188,480, Cl. 536-17.000.

Fulton, Ronald T.; and Moody, Roy A., to Panduit Corp. Cable tie mount and tie for use therewith. 4,188,004, Cl. 248-74.0PB.

Funderburk, James O., Jr.: *See*—
Vicik, Stephen J.; Kohler, William J.; and Funderburk, James O., Jr., 4,188,350, Cl. 525-232.000.

Furukawa, Yasuyoshi: *See*—
Suzuki, Takeshi; Furukawa, Yasuyoshi; Tomoda, Masayasu; and Ueta, Yutaka, 4,188,352, Cl. 525-187.000.

Furutu, Akira, to Japan Bano'k Co., Ltd. Apparatus for attaching tag pin. 4,187,970, Cl. 227-8.000.

Fuse, Shirou: *See*—
Asakura, Hiroshi; Chimura, Ippei; Kitazume, Keisuke; Kaneko, Yoshiyuki; Fuse, Shirou; and Ueno, Akio, 4,188,439, Cl. 428-215.000.
Asakura, Hiroshi; Chimura, Ippei; Kitazume, Keisuke; Kaneko, Yoshiyuki; Fuse, Shirou; and Ueno, Akio, 4,188,442, Cl. 428-216.000.

Fyfe, Edward R.; and Watson, Stewart C., to Watson Bowman Associates, Inc. High load bearing for bridges and similar structures. 4,187,573, Cl. 14-16.100.

G. D. Searle & Co.: *See*—
Kukla, Michael J., 4,188,485, Cl. 546-202.000.

G. D. Societa per Azioni: *See*—
Seragnoli, Enzo, 4,188,024, Cl. 270-67.000.

Gabzimalian, Vagram G.: *See*—
Sarkisian, Levon A.; Matsoian, Stepan G.; Gabzimalian, Vagram G.; Mailian, Shaen M.; Galstian, Albert P.; Azarian, Vazgen K.; Ter-Davtian, Zorik S.; Gevorkian, Raya G.; Gevorkian, Ogden A.; Khudoian, Korjun L.; Ovsepian, Lavrenty A.; Arutjunova, Amalia A.; and Mkrtchian, Foerbakh V., 4,188,406, Cl. 426-3.000.

Gaffar, Abdul, to Colgate-Palmolive Company. Antibacterial oral composition. 4,188,372, Cl. 424-54.000.

Gagne, Jean-Guy, to Hydro-Quebec. Spacer-damper. 4,188,502, Cl. 174-42.000.

Galitsina, Valentina V.: *See*—
Melnikov, Nikolai N.; Grapov, Artur F.; Razvodovskaya, Ljudmila V.; Popov, Petr V.; Sedykh, Aelita S.; Shapovalova, Galina K.; Abelentseva, Galina M.; Siforova, Tamara A.; Nikolaeva, Tatyana A.; Galitsina, Valentina V.; Stonov, Leonid D.; and Bakumenko, Ljudmila A., 4,188,382, Cl. 424-200.000.

Galstian, Albert P.: *See*—
Sarkisian, Levon A.; Matsoian, Stepan G.; Gabzimalian, Vagram G.; Mailian, Shaen M.; Galstian, Albert P.; Azarian, Vazgen K.; Ter-Davtian, Zorik S.; Gevorkian, Raya G.; Gevorkian, Ogden A.; Khudoian, Korjun L.; Ovsepian, Lavrenty A.; Arutjunova, Amalia A.; and Mkrtchian, Foerbakh V., 4,188,406, Cl. 426-3.000.

Garczynski, John S.: *See*—
Schisselbauer, John C.; Garczynski, John S.; Auchinleck, Richard J.; and LoFurno, Henry J., 4,187,980, Cl. 235-474.000.

Garner, Lloyd L., to Smith International, Inc. Rock bit combination to enhance cuttings removal. 4,187,921, Cl. 175-340.000.

Garrido, John A., to Litton Business Systems, Inc. Ribbon cartridge having cam means for moving ribbon sensing and reversing lever. 4,188,134, Cl. 400-208.000.

Garrison, Judd F., to John Thomas Batts, Inc. Swivel hook attachment for article hangers. 4,187,967, Cl. 223-92.000.

Garshelis, Ivan J. Current sensing device. 4,188,572, Cl. 323-9.000.

Gassman, Paul G.; and Cue, Berkeley W., to University of Minnesota, Regents of. Isatin process and products. 4,188,325, Cl. 260-325.00R.

Gaster, Ivan: *See*—
Holden, Homer N.; and Gaster, Ivan, 4,188,081, Cl. 339-15.000.

Gaulliard, Jean-Michel: *See*—
Ducret, Jacques; Gaulliard, Jean-Michel; and Vial, Jean, 4,188,381, Cl. 424-199.000.

Gavrev, Valery S.; Goncharuk, Jury M.; Birjukov, Sergei B.; Savitsky, Alexandr V.; and Popova, Ljudmila A., to Vsesojuzny Nauchno-Issledovatelsky Institut Po Razrabotke Nerazrushajuschikh Metodov I Sredsv Kon-trolya Kachestva Materialov. Method for ultrasonic inspection of materials and device for effecting same. 4,187,725, Cl. 73-613.000.

Gaylord, Richard P., to Clark Equipment Company. Fluid device and method for making. 4,187,766, Cl. 92-169.000.

Gebler, Kenneth A.: *See*—
Adams, Paul G.; and Gebler, Kenneth A., 4,188,416, Cl. 427-135.000.

General Electric Company: *See*—
Chang, Mike F.; Roesch, Alfred; and Kennedy, Richard W., 4,188,245, Cl. 148-188.000.
Corrigan, Francis R., 4,188,194, Cl. 51-307.000.
DallaPiazza, Dennis G., 4,188,536, Cl. 250-402.000.
Dills, Raymond L., 4,188,520, Cl. 219-10.55B.
Fox, Daniel W.; and Rock, John A., 4,188,314, Cl. 260-37.0PC.
Greskovich, Charles D., 4,188,450, Cl. 428-329.000.
Humphrey, James S., Jr., 4,188,451, Cl. 428-331.000.
Irwin, John W., 4,187,691, Cl. 62-324.000.
Jaquiss, Donald B. G.; and Mitchell, Lawrence C., 4,188,496, Cl. 568-723.000.
Lupinski, John H.; and Gorowitz, Bernard, 4,188,413, Cl. 427-30.000.
Nopanen, Esko J., 4,187,993, Cl. 241-89.200.
Palmer, Ansell W.; and Stevens, Francis J., 4,188,575, Cl. 324-103.00R.
Poling, Ronald W., 4,188,145, Cl. 403-112.000.

General Foods Corporation: *See*—
Bhimji, Amir A., 4,187,727, Cl. 73-706.000.
Rispoli, Joseph M.; Rogers, Morris A.; Sims, Rex J.; and Waitman, Reuben H., Sr., 4,188,410, Cl. 426-296.000.

General Foundry Products Corporation: *See*—
Reiland, Dennis J., 4,188,010, Cl. 249-197.000.

General Gas Light Company: *See*—
Loveless, Stanley M., 4,187,884, Cl. 137-625.690.

General Mining and Finance Corporation Limited: *See*—
Bohme, Rolf C.; and Luck, Dieter G., 4,188,165, Cl. 414-694.000.

General Motors Corporation: *See*—
Kitchin, Oscar G., 4,187,937, Cl. 192-45.000.

Genkin, Vitaly Y.: *See*—
Manokhin, Anatoly I.; Sitnov, Anatoly G.; Genkin, Vitaly Y.; and Liberman, Anatoly L., 4,187,898, Cl. 164-421.000.

Gensicke, Walter, to Keiper Automobiltechnik GmbH & Co KG. Adjustable hinge for motor-vehicle seat. 4,187,579, Cl. 16-139.000.

Gensike, Karl H.; and Sam, Ronald, to Photomatrix Corporation. Microfiche scanner module. 4,188,114, Cl. 355-54.000.

Geodesic Shelters, Inc.: *See*—
Ivers, Robert P.; and Thimsen, Mark J., 4,187,613, Cl. 33-174.00G.

Geomet, Inc.: *See*—
Allen, Richard T.; Moyer, Rudolph H.; Sibbett, Donald J.; Anderson, Howard H.; Martner, Glen R.; and Willis, Don, 4,187,836, Cl. 128-2.080.
Allen, Richard T.; Moyer, Rudolph H.; Sibbett, Donald J.; Anderson, Howard H.; Martner, Glen R.; and Willis, Don, 4,187,859, Cl. 128-725.000.

Gerasimian, Dzhemma A.: *See*—
Mndzhoian, Oganes L.; Avetisian, Svetlana A.; Akopian, Nina E.; and Gerasimian, Dzhemma A., 4,188,398, Cl. 424-274.000.

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Guay, Wilbur J., to Newmont Exploration Limited. Recovery of gold from carbonaceous gold-bearing ores. 4,188,208, Cl. 75-105.000.
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Lindahl, Herbert S., 4,187,690, Cl. 62-138.000.
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Gust, Charles F. Stoma centering apparatus. 4,187,850, Cl. 128-283.000.
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Hahn, James H., to ACR Electronics, Inc. Electro-mechanical machine. 4,188,556, Cl. 310-268.000.
Hahn, Raymond F. Form for a mortar cap. 4,187,648, Cl. 52-21.000.
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Hall, Philip S.: *See*—
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Halpine, Joseph C. Ball valve having improved sealing capability. 4,188,015, Cl. 251-315.000.
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Boykin, Richard A.; and Hamilton, Gordon A., 4,187,977, Cl. 229-43.000.
Hamilton, Michael D. Out-of-frame detector for motion picture film duplicating equipment. 4,188,112, Cl. 355-50.000.
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Hammann, Ingeborg: *See*—
Maurer, Fritz; and Hammann, Ingeborg, 4,188,383, Cl. 424-200.000.
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Selcukoglu, Yuksel A.; Husain, Matloob; and Hanke, Carl C., Jr., 4,187,689, Cl. 62-54.000.

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Hansen, Lee A.; and Conrad, William A. Blower attachment for line trimmer. 4,187,577, Cl. 15-328.000.

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Althuis, Thomas H.; Harbert, Charles A.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,188,495, Cl. 568-633.000.

Harden, Jerrell W.; and Brown, William P., to Brown Manufacturing Corporation. Soil conditioning and seed bed preparing apparatus. 4,187,916, Cl. 172-146.000.

Hardy, James H.; and Roberson, James E. Method and apparatus for applying chemicals to weeds and plants. 4,187,638, Cl. 47-1.500.

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Sanson, Henry E., III; and Hartman, Wallace R., Jr., 4,188,300, Cl. 252-48.600.

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Senften, John W., 4,187,934, Cl. 191-39.000.

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Watanabe, Kunio; and Hashimoto, Yoshio, 4,188,241, Cl. 148-12.00F.

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Haupin, Warren E.: *See*—
Seger, Edward J.; and Haupin, Warren E., 4,188,267, Cl. 204-1.00T.

Hauser, Thomas M., to Mentor Corporation. Sheath arrangement for male urinal device and method of forming the same. 4,187,851, Cl. 128-295.000.

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Kuhnlein, Hans, 4,187,904, Cl. 165-104.000.

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Heckelman, James D.; and Ziemke, Robert A., to Dan-Mar Co. Inc. Alarm system. 4,188,621, Cl. 340-528.000.

Heffernan, Bart T. Blood sample handling apparatus and method. 4,187,861, Cl. 128-764.000.

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Heise, Arend: *See*—
Bossert, Friedrich; Wehinger, Egbert; Meyer, Horst; Heise, Arend; Kazda, Stanislav; Stoepel, Kurt; Towart, Robertson; Vater, Wulf; and Schlossmann, Klaus, 4,188,395, Cl. 424-266.000.

Heise, Richard L.: *See*—
Webster, Sherwood F.; and Heise, Richard L., 4,187,820, Cl. 123-141.000.

Helene Curtis Industries, Inc.: *See*—
Zwiren, Jan M.; Casper, Selma M.; and Sinclair, Norman, 4,187,866, Cl. 132-151.000.

Hemperly, Lyle D., Jr., to Seal Incorporated. Vacuum press. 4,188,254, Cl. 156-382.000.

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Henricksen, Clifford A.; and Ureda, Mark S., to Altec Corporation. Loudspeaker horn. 4,187,926, Cl. 181-192.000.

Henry, Elbert C., to Henry Enterprises, Inc. Fuel service tank with self-retracting hose reel. 4,187,962, Cl. 222-173.000.

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Henry, Elbert C., 4,187,962, Cl. 222-173.000.

Hensel, Jorg: *See*—
Volker, Herbert; Koberstein, Edgar; Bozon, Alfred; and Hensel, Jorg, 4,188,309, Cl. 252-466.00J.

Hensley, Albert L., Jr.: *See*—
Quick, Leonard M.; and Hensley, Albert L., Jr., 4,188,284, Cl. 208-216.0PP.

Hepp, Dennis G.; Neumann, Robert A.; and Citron, Paul, to Medtronic, Inc. Implantable demand pacemaker and monitor. 4,187,854, Cl. 128-419.0PG.

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Ward, Frederick G., 4,187,942, Cl. 198-345.000.

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Miller, Clarence S., Jr.; and Hager, Richard A., 4,187,902, Cl. 165-76.000.

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Holz, Emil, 4,188,286, Cl. 209-273.000.

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Betancourt, Jorge; and Hernandez, Jose, 4,188,128, Cl. 366-72.000.

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Hill, David T., to SmithKline Corporation. 2,2-Alkyldiylbis(thio)bis-(imidazoles). 4,188,397, Cl. 424-273.00R.

Hill, Homer G.: *See*—
Foley, Kevin M.; and Hill, Homer G., 4,188,454, Cl. 428-391.000.

Hill, John C. Antitheft guard for ignition switch. 4,187,706, Cl. 70-428.000.

Hill, Philip R., to Chromatex, Inc. Laminated fabric of polypropylene. 4,188,445, Cl. 428-246.000.

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Hiraga, Michio, to Fuji Xerox Co., Ltd. Copying device with facsimile function. 4,188,113, Cl. 355-51.000.

Hirai, Tosihisa: *See*—
Suzuki, Yasuo; and Hirai, Tosihisa, 4,188,555, Cl. 310-162.000.

Hirata, Kenichi: *See*—
Takahashi, Nobuhiro; and Hirata, Kenichi, 4,188,243, Cl. 148-155.000.

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Tsuji, Kunio; Hisano, Katsukuni; Sakai, Akira; and Nakamura, Shozo, 4,187,685, Cl. 60-660.000.

Hitachi Chemical Company, Ltd.: *See*—
Takahashi, Hiroshi; Nakao, Kiyoshi; and Katagiri, Masaaki, 4,188,415, Cl. 427-97.000.

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Iwasaki, Takashiroh; and Mameda, Jun-ichi, 4,188,551, Cl. 307-311.000.
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Ohninata, Ichiro, 4,188,548, Cl. 307-252.00C.
Okawa, Tadashi; Honbu, Mitsuyuki; and Matsuda, Yasuo, 4,188,663, Cl. 363-51.000.
Suzuki, Seiko; Takasaka, Masahiro; Sugawara, Toru; and Takahasi, Toru, 4,188,623, Cl. 340-595.000.
Tsuji, Kunio; Hisano, Katsukuni; Sakai, Akira; and Nakamura, Shozo, 4,187,685, Cl. 60-660.000.

Hochsprung, Dennis H.; Wright, Alan C.; Annas, Robert I.; and Purcell, Pat W., to NL Industries, Inc. Method and apparatus for monitoring fluid flow through a drill string. 4,188,624, Cl. 340-606.000.

Hodemaekers, Andreas M. L., to U.S. Philips Corporation. Gas discharge display arrangement. 4,188,625, Cl. 340-642.000.

Hodgson, Robert F.; and Petro, John D., to Commercial Shearing Inc. Compensated work port fluid valves. 4,187,877, Cl. 137-596.000.

Hoechst Aktiengesellschaft: *See*—
Bathelt, Heinrich, 4,188,307, Cl. 252-355.000.
Semjonow, Valentin, 4,187,586, Cl. 19-161.100.
Strecker, Helmut, 4,188,539, Cl. 250-432.0PD.

Hoegerle, Karl, to Ciba-Geigy Corporation. 5-Alkylsulphonyl- and 5-alkenylsulphonylbarbituric acids and derivatives thereof. 4,188,483, Cl. 544-302.000.

Hoffman, David S.: *See*—
Rogers, Walter C., Jr.; and Hoffman, David S., 4,188,062, Cl. 297-61.000.

Hogan, Clarence V.: *See*—
Selvin, Gerald J.; Oliver, Leland W.; Yamamoto, Stephen K.; and Hogan, Clarence V., 4,187,605, Cl. 29-629.000.

Hogg, Walter R.; and Brunsting, Albert, to Coulter Electronics, Inc. Mirror image ellipsoid radiation collector and method. 4,188,542, Cl. 250-458.000.

Hogg, Walter R.: *See*—
Brunsting, Albert; and Hogg, Walter R., 4,188,543, Cl. 250-458.000.

Hoinski, Walter W., to Power Systems Development Corporation. Threshold plate door alarm. 4,187,797, Cl. 116-87.000.

Hoinski, Walter W., to Power Systems Development Corporation. Solar heating system. 4,187,834, Cl. 126-425.000.

Holden, Geoffrey; and Gouw, Lam H., to Shell Oil Company. Articles resistant to attack by fatty substances, made from polystyrene blends, and compositions. 4,188,432, Cl. 428-35.000.

Holden, Homer N.; and Gaster, Ivan, to Dayco Corporation. Vacuum cleaner hose assembly and method of making same. 4,188,081, Cl. 339-15.000.

Holladay, Jack T. Method of and apparatus for testing visual integrity. 4,188,097, Cl. 351-36.000.

Holland-Letz, Gunter, to Dymo Industries, Inc. Apparatus for printing and dispensing labels. 4,187,778, Cl. 101-291.000.

Hollaway, Graham: *See*—
Alexander, Alfred J.; Jibb, David J.; and Hollaway, Graham, 4,188,627, Cl. 340-747.000.

Hollenbeck, Paul R. Hand operated flexible stamp carrier. 4,187,772, Cl. 101-379.000.

Holly, Sandor: *See*—
Massie, Norbert A.; and Holly, Sandor, 4,188,122, Cl. 356-349.000.

Hollymatic Corporation: *See*—
Wagner, Richard C., 4,187,581, Cl. 17-32.000.

Holmes, Billy G.; and Crofford, Jimmie, to Mobil Oil Corporation. Apparatus for mixing gas and liquid at a downhole location. 4,188,068, Cl. 299-5.000.

Holmes, Neil C.: *See*—
Siegman, Anthony E.; Holmes, Neil C.; and Artusy, Max T., 4,188,591, Cl. 331-94.50P.

Holt, Lloyd J., to United States of America, Navy. Inflight, stores, forces and moments measuring device. 4,187,760, Cl. 89-1.50E.

Holt, Lloyd J.; and Panlaqui, Clayton E., to United States of America, Navy. Variable force control system for weapon ejection mechanisms. 4,187,761, Cl. 89-1.50R.

Holz, Emil, to Hermann Finckh Maschinenfabrik. Screening apparatus for fiber suspensions. 4,188,286, Cl. 209-273.000.

Homan, Pieter: *See*—
Schayes, Raymond G.; Homan, Pieter; and Rothgordt, Ulf, 4,188,643, Cl. 358-280.000.

Homma, Jun-ichi: *See*—
Kawai, Jun; Homma, Jun-ichi; Watanabe, Saburo; and Watanabe, Masahiro, 4,188,523, Cl. 219-83.000.

Honbu, Mitsuyuki: *See*—
Okawa, Tadashi; Honbu, Mitsuyuki; and Matsuda, Yasuo, 4,188,663, Cl. 363-51.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Sakurai, Yoshitoshi, 4,187,677, Cl. 60-282.000.

Honeywell Inc.: *See*—
Battersby, Robert J.; and Dietiker, Paul, 4,188,013, Cl. 251-175.000.
Hamelink, William B., 4,188,180, Cl. 431-46.000.

Hoogstraate, Hendrik, to N. V. Hollandse Signaalapparaten. Mixer. 4,188,584, Cl. 325-446.000.

Hooker Chemicals & Plastics Corp.: *See*—
Adams, Robert G.; Pouli, Dirk; Ridgley, Dana H.; and Stephens, Donald E., 4,188,464, Cl. 429-210.000.

Hooper, Lindsay A., to Repco Limited. Cycle exerciser. 4,188,030, Cl. 272-73.000.

Hoover, William: *See*—
Bolton, Joseph A.; and Hoover, William, 4,188,078, Cl. 308-187.000.

Horkey, Edward J. Drag chain links. 4,187,943, Cl. 198-730.000.

Horn, Hannes S. Method and apparatus for production of plate glass. 4,188,200, Cl. 65-90.000.

Hosaka, Akio; and Aono, Shigeo, to Nissan Motor Company, Limited. Closed loop fuel control with sample-hold operative in response to sensed engine operating parameters. 4,187,812, Cl. 123-119.0EC.

Hotta, Tetsuya: *See*—
Yoshikumi, Chikao; Omura, Yoshio; and Hotta, Tetsuya, 4,188,384, Cl. 424-180.000.

Houghtaling, Samuel V., to Societe de Prayon. Manufacture of phosphoric acid. 4,188,366, Cl. 423-320.000.

Hounsfield, Godfrey N., to EMI Limited. Apparatus for examining a body by radiation such as X or gamma radiation. 4,188,541, Cl. 250-445.00T.

Howard, Dennis D., to Lord Corporation. Actinic radiation-curable formulations containing at least one unsaturated polyether-esterurethane oligomer. 4,188,455, Cl. 428-423.100.

Howard, Norman W. Light frame adapter. 4,188,656, Cl. 362-365.000.

Howell, Stephen L.: *See*—
Robinson, John W.; and Howell, Stephen L., 4,187,756, Cl. 84-1.240.

Hsia, Yukun, to McDonnell Douglas Corporation. Associative interconnection circuit. 4,188,670, Cl. 365-49.000.

Hufford, Charles D., to University of Mississippi, The. Antimicrobial compositions. 4,188,392, Cl. 424-258.000.

Hugelshofer, Max, to Etablissement Dentaire Ivoclar. Metallizing gun for applying sprayed metal. 4,187,984, Cl. 239-13.000.

Hughart, Robert P.: *See*—
Wilson, Peter C.; and Hughart, Robert P., 4,188,535, Cl. 250-359.000.

Hughes Aircraft Company: *See*—
Bilow, Norman; Landis, Abraham L.; and Miller, Leroy J., 4,188,337, Cl. 260-465.00D.
Harp, Robert S.; and Russell, Kenneth J., 4,188,590, Cl. 331-56.000.

Hughes Tool Company: *See*—
Scales, Stanley R., 4,188,242, Cl. 148-15.500.

Hughey, John E., to Zurn Industries, Inc. Valve having internally pressurized sealing elements. 4,187,878, Cl. 137-601.000.

Hugosson, Evald; and Kullendorf, Anders, to Stal-Laval Turbin AB. Protective coating on a steel surface. 4,188,458, Cl. 428-556.000.

Huizer, Leendert; Van Namen, Dirk J.; and Oranje, Pieter J. D., to Shell Oil Company. Purification of 3,5-xylenol. 4,188,497, Cl. 568-799.000.

Hulsmann, Hans-Leo; and Renckhoff, Gustav, deceased (by Grave, Brunhilde Renckhoff nee, heir and legal representative), to Dynamit Nobel Aktiengesellschaft. Carrier-bound acylases. 4,188,263, Cl. 439-179.000.

Hulthe, Leif: *See*—
Fermer, Karl-Erik; and Hulthe, Leif, 4,187,879, Cl. 137-601.000.

Humpert, Jurgen; Eckel, Hans-Joachim; and Behrenberg, Rolf, to ITT Industries, Incorporated. Single-handle mixing valve. 4,187,880, Cl. 137-625.170.

Humphrey, James S., Jr., to General Electric Company. Polycarbonate article coated with an adherent, durable, silica filled organopolysiloxane coating and process for producing same. 4,188,451, Cl. 428-331.000.

Hunt, Morris C. Electrical filter. 4,188,598, Cl. 333-207.000.

Hunter Douglas International, N.V.: *See*—
Frentzel, Kurt H., 4,187,897, Cl. 160-177.000.

Hunter, Edward E., to Goodyear Tire & Rubber Company, The. Method for coating wire on a spool. 4,188,420, Cl. 427-295.000.

Huraux, Claude: *See*—
Barge, Jean; Catte, Raymond; Chapelet, Gilbert; Bui, Ai; Dejean, Pierre; Huraux, Claude; and Mayoux, Christian, 4,188,303, Cl. 252-63.700.

Hurni, William M.: *See*—
McAleer, William J.; and Hurni, William M., 4,187,989, Cl. 241-2.000.

Husain, Matloob: *See*—
Selcukoglu, Yuksel A.; Husain, Matloob; and Hanke, Carl C., Jr., 4,187,689, Cl. 62-54.000.

Hutchison, Stanley O.; and Anderson, Glenn W., to Chevron Research Company. Slant hole foam cleanout. 4,187,911, Cl. 166-312.000.

Hydro-Quebec: *See*—
Gagne, Jean-Guy, 4,188,502, Cl. 174-42.000.

Hydroacoustics, Inc.: *See*—
Bouyoucos, John V., 4,187,917, Cl. 173-131.000.
Nelson, David E., 4,188,610, Cl. 367-14.000.

Hyner, Jacob; Gradowski, Steven; and Maestrone, Thomas F., to Whyco Chromium Company, Inc. Corrosion resistant plating and method utilizing alloys having micro-throwing power. 4,188,459, Cl. 428-648.000.

I.N.R.A.: *See*—
Thivend, Pierre; Mercier-Greenwood, Christiane; and Guilbot, Andre, 4,188,466, Cl. 435-18.000.

Ichioka, Athushi: *See*—
Muraki, Ryoji; Takemura, Shinichiro; Ohashi, Yoshio; and Ichioka, Athushi, 4,188,190, Cl. 23-232.00R.

ICI Americas Inc.: *See*—
Markiewitz, Kenneth H.; and Restaino, Alfred J., 4,188,349, Cl. 525-366.000.

Ideal Toy Corporation: *See*—
Nielsen, Edwin A., 4,187,637, Cl. 46-262.000.

Idenawa, Hiroyuki; Tanzawa, Misao; and Ohno, Yukihiro, to Ricoh Company, Ltd. Fixing apparatus for electrophotography. 4,188,109, Cl. 355-3.0FU.

Igarashi, Yoshiaki: *See*—
Inouye, Hiromasa; Ohtsuki, Tomonari; and Igarashi, Yoshiaki, 4,188,086, Cl. 339-176.0MF.

Ikeda, Hisao: *See*—
Murata, Atsuo; Tsuchiya, Shuji; Suzuki, Hideo; and Ikeda, Hisao, 4,188,498, Cl. 568-875.000.

Ikeda, Sadaharu: *See*—
Sato, Masamichi; Ikeda, Sadaharu; and Ikeda, Tomoaki, 4,188,215, Cl. 430-156.000.

Ikeda, Tomoaki: *See*—
Kido, Keishiro; Yoshida, Satoshi; and Ikeda, Tomoaki, 4,188,214, Cl. 430-494.000.
Sato, Masamichi; Ikeda, Sadaharu; and Ikeda, Tomoaki, 4,188,215, Cl. 430-156.000.

Illinois Tool Works Inc.: *See*—
Reinwall, Ernest W., Jr., 4,187,658, Cl. 52-489.000.

Imamura, Yoshiaki: *See*—
Abiru, Hisanori; Nakao, Yoshiaki; Imamura, Yoshiaki; and Sada, Hidetaka, 4,187,614, Cl. 33-174.00L.

Imperial Chemical Industries Limited: *See*—
Ellis, Peter M.; and Selwood, Alan, 4,188,436, Cl. 428-198.000.
McClean, Arthur J.; and Montgomery, Kenneth F., 4,188,545, Cl. 250-561.000.
Payne, David T.; and Brand, Boris P., 4,188,376, Cl. 424-173.000.

Indicon Inc.: *See*—
Citrin, Paul S., 4,187,724, Cl. 73-425.40P.

Industrial Blast Coil Corporation: *See*—
Stikeleather, Allan, 4,187,710, Cl. 72-204.000.

Industrial Wire & Metal Forming, Inc.: *See*—
Champoux, Louis A., 4,187,708, Cl. 72-30.000.

Ing. C. Olivetti & C., S.p.A.: *See*—
Pasini, Arnaldo; Dalmasso, Claudio; Brescia, Riccardo; and Bosio, Roberto, 4,188,139, Cl. 400-696.000.

Ingenthron, Walter W., Jr.: *See*—
Wasley, William L.; and Ingenthron, Walter W., Jr., 4,188,422, Cl. 28-167.000.

Inoue, Hidehiko: *See*—
Morishita, Masanobu; Inoue, Hidehiko; Ando, Takao; and Kawasaki, Mitsuru, 4,188,642, Cl. 358-213.000.
Inoue, Morio: *See*—
Itoh, Kunio; and Inoue, Morio, 4,188,244, Cl. 148-174.000.
Inouye, Hiromasa; Ohtsuki, Tomonari; and Igarashi, Yoshiaki, to Bunker Ramo Corporation. Connector for terminating flexible parallel conductors. 4,188,086, Cl. 339-176.0MF.
Institut fur Biomedizinische Technik: *See*—
Reis, A.; Kirmaier, N.; and Schoberl, M., 4,188,278, Cl. 204-268.000.
Institut Organicheskoi Khimii Akademii Nauk Armyanskoi: *See*—
Sarkisian, Levon A.; Matsoian, Stepan G.; Gabzimalian, Vagram G.; Mailian, Shaen M.; Galstian, Albert P.; Azarian, Vazgen K.; Ter-Davtian, Zorik S.; Gevorkian, Raya G.; Gevorkian, Ogden A.; Khudoian, Korjun L.; Ovsepian, Lavrenty A.; Arutjunova, Amalia A.; and Mkrtchian, Foerbakh V., 4,188,406, Cl. 426-3.000.
Instrumentation Specialties Company: *See*—
Allington, Robert W., 4,188,574, Cl. 324-51.000.
International Business Machines Corporation: *See*—
Cheatham, Samuel D.; Robinson, Neil L.; and Smathers, Edmond W., 4,188,649, Cl. 360-118.000.
Finlay, David E., 4,188,668, Cl. 364-900.000.
Giordano, Francis P.; Kuhn, Lawrence; Lane, Ramon; Lee, Chen-Hsiung; and Zierdt, Gene O., 4,188,635, Cl. 346-75.000.
Jaerisch, Walter; and Makosch, Guenter, 4,188,124, Cl. 356-356.000.
Nagel, Dennis M.; O'Neal, Douglas; Petroskey, Paul W.; van den Berg, Jan W.; Wildes, Donald V.; and Wu, David C., 4,188,665, Cl. 364-200.000.
International Harvester Company: *See*—
Deschamps, Joseph P., 4,187,924, Cl. 180-53.00R.
McClure, Maxwell D., III; Lester, William D.; and Fachini, Robert M., 4,187,923, Cl. 180-215.000.
International Standard Electric Corporation: *See*—
Munchow, Peter; and Kaiser, Walter, 4,188,509, Cl. 179-18.0AD.
Rein, Wolf-Heider, 4,188,650, Cl. 360-133.000.
International Telephone and Telegraph Corporation: *See*—
Selvin, Gerald J.; Oliver, Leland W.; Yamamoto, Stephen K.; and Hogan, Clarence V., 4,187,605, Cl. 29-629.000.
Intertecnica S.p.A.: *See*—
La Marca, Giuseppe, 4,188,054, Cl. 292-226.000.
Invicta Plastics Limited: *See*—
Jones-Fenleigh, Edward J., 4,188,036, Cl. 273-265.000.
Ippoliti, Ralph J.; and Nelson, John J., to Product Dynamics, Ltd. Container of the combination-locked envelope type. 4,187,703, Cl. 70-63.000.
Irwin, John W., to General Electric Company. Heat pump bypass valve arrangement. 4,187,691, Cl. 62-324.000.
Irwin, Robert S., to Du Pont de Nemours, E. I., and Company. Aromatic polyester consisting essentially of p-oxybenzoyl units, terephthaloyl units, 2,6-dioxynaphthalene or 2,6-dioxyanthraquinone units and m-oxybenzoyl or 1,3-dioxyphenylene units. 4,188,476, Cl. 528-190.000.
Isaka, Kinichi: *See*—
Mizukami, Etsuo; Kishishita, Hiroshi; Kawaguchi, Masashi; Endo, Yoshihiro; and Isaka, Kinichi, 4,188,565, Cl. 313-509.000.
Isdale, Charles E., Sr.: *See*—
Melby, William E.; Isdale, Charles E., Sr.; and Collins, Vernon K., 4,188,467, Cl. 435-274.000.
Isenberg, Raymond C. Attachable pipe radiator. 4,187,905, Cl. 165-181.000.
Ishibashi, Masamichi, to Fujitsu Limited. Address converter in a data processing apparatus. 4,188,662, Cl. 364-200.000.
Ishikawa, Masakazu; Shibatani, Juichi; and Ito, Sadayoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Anti-vibration apparatus for a vehicle brake system. 4,188,073, Cl. 303-87.000.
Ishizawa, Hidenori: *See*—
Watanabe, Atsuo; Ishizawa, Hidenori; and Uno, Masahiro, 4,188,534, Cl. 250-345.000.
Ishizuka, Naoyasu: *See*—
Pernet, Andre G.; Nakamoto, Hiromasa; and Ishizuka, Naoyasu, 4,188,331, Cl. 260-343.600.
Isostat: *See*—
du Temple de Rougemont, Christian, 4,188,518, Cl. 200-159.00R.
Itaya, Shikiho: *See*—
Yoshioka, Toshihiro; Itaya, Shikiho; Arima, Yusaku; and Tanaka, Hirokazu, 4,188,365, Cl. 423-239.00A.
Ito, Jinichi, to Yamada Yuki Seizo Co., Ltd. Diaphragm pump. 4,188,170, Cl. 417-387.000.
Ito, Keiso: *See*—
Tsukamoto, Goro; Yoshino, Koichiro; Kohno, Toshihiko; Taguchi, Masahiro; Dezawa, Katsumi; Kagaya, Hajime; Ito, Keiso; and Nose, Takashi, 4,188,486, Cl. 546-271.000.
Ito, Kenichiro; and Schischkoff, Kurt, to Yoshida Kogyo K K. Machine for automatically cutting an elongate material into lengths. 4,187,750, Cl. 83-67.000.
Ito, Masanori: *See*—
Sugahara, Yujiro; Noshi, Yoshibumi; Naito, Hiroyuki; Takahashi, Akira; Ito, Masanori; and Tuchida, Hisashi, 4,188,268, Cl. 204-2.100.
Ito, Sadayoshi: *See*—
Ishikawa, Masakazu; Shibatani, Juichi; and Ito, Sadayoshi, 4,188,073, Cl. 303-87.000.
Itoh, Kunio; and Inoue, Morio, to Matsushita Electric Industrial Co., Ltd. Method of making a semiconductor light-emitting device utilizing low-temperature vapor-phase deposition. 4,188,244, Cl. 148-174.000.
ITT Industries, Incorporated: *See*—
Humpert, Jurgen; Eckel, Hans-Joachim; and Behrenberg, Rolf, 4,187,880, Cl. 137-625.170.
Ivers, Robert P.; and Thimsen, Mark J., to Geodesic Shelters, Inc. Jig for precise measurement of panels for geodesic. 4,187,613, Cl. 33-174.00G.
Iwahara, Makoto: *See*—
Kasuga, Masao; Takahashi, Nobuaki; Sato, Masaaki; Seki, Kohji; Mori, Toshinori; and Iwahara, Makoto, 4,188,504, Cl. 179-1.0GP.
Iwanaga, Sadaaki; Morita, Takashi; Nakamura, Shin; Takahashi, Kenji; and Niwa, Makoto, to Seikagaku Kogyo Co. Ltd. Process for determining bacterial endotoxin and reagents used therefor. 4,188,264, Cl. 23-230.00B.
Iwasa, Masakazu; Kato, Hisashi; and Kudo, Yoshio, to Fuji Photo Film Co., Ltd. Electrostatic print marking apparatus. 4,187,774, Cl. 101-1.000.
Iwasaki, Takashiroh; and Mameda, Jun-ichi, to Hitachi, Ltd. Amplifier circuit having photoelectric converter. 4,188,551, Cl. 307-311.000.
Iwata Co., Ltd.: *See*—
Iwata, Takuzo, 4,187,615, Cl. 34-1.000.
Iwata, Takuzo, to Iwata Co., Ltd. Process for treating feathers and cyclone used for carrying out the process. 4,187,615, Cl. 34-1.000.
Izatt, James P., to Cellsystem AG. Apparatus for watering and draining soil. 4,188,154, Cl. 405-43.000.
Jablin, Richard. Treatment of waste liquor. 4,188,195, Cl. 55-89.000.
Jacobs, Paul L., to United States of America, Army. Angular rate sensor. 4,188,576, Cl. 324-163.000.
Jacques, Andre: *See*—
D'Auria, Luigi; Jacques, Andre; and Malsot, Christian, 4,188,087, Cl. 350-96.200.
Jaeckh, Christof: *See*—
Becker, Hans-Juergen; Jaeckh, Christof; Koester, Eberhard; Loeser, Werner; Ohlinger, Manfred; and Steck, Werner, 4,188,302, Cl. 252-62.560.
Jaerisch, Walter; and Makosch, Guenter, to International Business Machines Corporation. Interferometric measuring system. 4,188,124, Cl. 356-356.000.
Jagenberg Werke Aktiengesellschaft: *See*—
Walde, Peter, 4,187,753, Cl. 83-674.000.
Jameel, Khaja M.: *See*—
Koppensteiner, James V.; Jameel, Khaja M.; Kubik, Charles K.; and Len, George, 4,187,604, Cl. 29-622.000.
James, Gordon E., to TRW Inc., Systems & Energy. Dispensing method and system for lubricating oil and other liquids. 4,187,930, Cl. 184-1.00R.
James, Robert G. Variable speed traction transmission. 4,187,731, Cl. 74-198.000.
Janko, Bozidar, to Tektronix, Inc. Cathode ray tube having an electron lens system including a meshless scan expansion post deflection acceleration lens. 4,188,563, Cl. 313-460.000.
Janome Sewing Machine Co. Ltd.: *See*—
Takenoya, Hideaki; and Makabe, Machiro, 4,187,789, Cl. 112-158.00E.
Japan Bano'k Co., Ltd.: *See*—
Furutu, Akira, 4,187,970, Cl. 227-8.000.
Japan Medical Supply Co., Ltd.: *See*—
Kurata, Motoji, 4,188,360, Cl. 422-46.000.
Jaquiss, Donald B. G.; and Mitchell, Lawrence C., to General Electric Company. Process for preparing 2,2-bis(4-hydroxy-phenyl) propane from distillation by-products thereof. 4,188,496, Cl. 568-723.000.
Jayne, Gerald J. J.; and Woods, David R., to Edwin Cooper and Company Limited. Lubricant additive. 4,188,297, Cl. 252-45.000.
Jenaer Glaswerk Schott & Gen.: *See*—
Gliemeroth, Georg; and Meckel, Lothar, 4,188,089, Cl. 350-96.340.
Jennings, Charles T.: *See*—
Golden, Stephen P.; and Jennings, Charles T., 4,187,723, Cl. 73-295.000.
Jensen, Harbo P., to Chevron Research Company. Method for removing arsenic from shale oil. 4,188,280, Cl. 208-53.000.
Jensen, Knud B.: *See*—
Andersen, Axel; Knudsen, Poul U.; and Jensen, Knud B., 4,188,088, Cl. 350-96.230.
Jewry, Ian C.: *See*—
Gillings, Christopher; Jewry, Ian C.; and Haynes, Harold G., 4,188,202, Cl. 71-88.000.
Jibb, David J.: *See*—
Alexander, Alfred J.; Jibb, David J.; and Hollaway, Graham, 4,188,627, Cl. 340-747.000.
Jirkovsky, Ivo L., to Ayerst McKenna & Harrison, Inc. 1,2,3,4-Tetrahydropyrrolo(1,2-A)pyrazines. 4,188,389, Cl. 424-250.000.
Jobe, William T., II. Slotting fastener driving device. 4,187,589, Cl. 227-66.000.
John D. Hollingsworth on Wheels, Inc.: *See*—
Lowe, Jerry B., 4,187,585, Cl. 19-98.000.
John Thomas Batts, Inc.: *See*—
Garrison, Judd F., 4,187,967, Cl. 223-92.000.
John Zink Company: *See*—
Zink, John S.; Reed, Robert D.; and Schwartz, Robert E., 4,188,183, Cl. 431-202.000.
Johnson, Bruce K.: *See*—
Biber, Conrad H.; Johnson, Bruce K.; and Whiteside, George D., 4,188,103, Cl. 354-27.000.
Johnson, Gary R., to Tri-State Oil Tool Industries, Inc. Enlarged bore hole drilling method and apparatus. 4,187,920, Cl. 175-267.000.

Johnson, Jesse R., to Knowles, Coyle E., a part interest to each; and Fisher, Eugene L., a part interest to each. Butterfly valve construction. 4,188,012, Cl. 251-173.000.

Johnson & Johnson: *See*—
Friedman, Norman J., 4,188,446, Cl. 428-288.000.

Johnson, Kenneth V., to Bucyrus-Erie Company. Hydrostatic winch. 4,187,681, Cl. 60-395.000.

Johnson, Michael R.: *See*—
Althuis, Thomas H.; Harbert, Charles A.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,188,495, Cl. 568-633.000.

Johnson, Robert H., to Motorola, Inc. Passive navigation system with frequency coding. 4,188,629, Cl. 343-6.50R.

Johnsson, Mans K. O.; and Eriksson, Lars A., to Uddeholms Aktiebolag. Metallurgical process. 4,188,206, Cl. 75-60.000.

Jones-Fenleigh, Edward J., to Invicta Plastics Limited. Board game with letter shaped playing pieces. 4,188,036, Cl. 273-265.000.

Jones, Harry S.; Kirkpatrick, David B.; and Wilson, Robert G., to United States of America, Navy. Marine mine. 4,187,779, Cl. 102-18.00M.

Jones, Richard B.: *See*—
Jones, Robert H., Jr.; and Jones, Richard B., 4,187,767, Cl. 92-171.000.

Jones, Robert H., Jr.; and Jones, Richard B. Diesel cylinder head and liner. 4,187,767, Cl. 92-171.000.

Jordaan, Ian J.: *See*—
Gillott, Jack E.; Jordaan, Ian J.; Loov, Robert E.; and Shrive, Nigel G., 4,188,230, Cl. 106-70.000.

Joslyn Mfg. and Supply Co.: *See*—
Pranke, Walter T.; and Wilms, Manfred W., 4,188,561, Cl. 313-325.000.

Joyner, Bobby L.: *See*—
Dornfeld, John E.; and Joyner, Bobby L., 4,188,651, Cl. 361-322.000.

Jozat, Walter: *See*—
Anderka, Gerold; and Jozat, Walter, 4,188,634, Cl. 346-1.100.

Juchmann, Heinz: *See*—
Gerstenkoper, Heinrich; and Juchmann, Heinz, 4,188,637, Cl. 357-79.000.

Judson, Philip N. Condensers. 4,187,903, Cl. 165-76.000.

Juh, Yang R. Portable table. 4,187,785, Cl. 108-36.000.

Juhasz, Zoltan; and Varju, Gyula, to Budapesti Muszaki Egyetem. Process for preparing hydraulic binding materials of high bonding capacity from glassy pyrogenic rocks. 4,188,233, Cl. 106-97.000.

Junak, Edward M., to Teletronics Co., Inc. of Clifton. Method and apparatus for igniting and reigniting combustible fuel. 4,188,182, Cl. 431-80.000.

Jung, Lothar. Apparatus for forming an ingot in a rotating housing. 4,188,201, Cl. 65-302.000.

Juskevic, John. Key duplicating machine. 4,188,163, Cl. 409-82.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Mori, Ikuo; and Yoshida, Kenichi, 4,187,737, Cl. 74-471.0XY.

Kagaya, Hajime: *See*—
Tsukamoto, Goro; Yoshino, Koichiro; Kohno, Toshihiko; Taguchi, Masahiro; Dezawa, Katsumi; Kagaya, Hajime; Ito, Keiso; and Nose, Takashi, 4,188,486, Cl. 546-271.000.

Kahler, Richard W. Three-point, plug type sealing means for a hollow, cylindrical container, particularly a liquid-filtered smoking device. 4,187,885, Cl. 138-89.000.

Kaiser, Walter: *See*—
Munchow, Peter; and Kaiser, Walter, 4,188,509, Cl. 179-18.0AD.

Kalamazoo Manufacturing Company: *See*—
Van Linder, Basil R.; Van Linder, Ronald C.; and McLane, Fredrick G., 4,187,966, Cl. 222-601.000.

Kamachi, Shinichi; and Ohkura, Yosuke, to Chugai Seiyaku Kabushiki Kaisha. Ester of higher fatty acid and reagent for determination of activity of lipase. 4,188,320, Cl. 260-202.000.

Kanai, Takao; and Nishikawa, Yashuhisa, to Clarion Co., Ltd. Pushbutton tuner. 4,187,729, Cl. 74-10.900.

Kanebo, Ltd.: *See*—
Tsukamoto, Goro; Yoshino, Koichiro; Kohno, Toshihiko; Taguchi, Masahiro; Dezawa, Katsumi; Kagaya, Hajime; Ito, Keiso; and Nose, Takashi, 4,188,486, Cl. 546-271.000.

Kaneko, Yoshiyuki: *See*—
Asakura, Hiroshi; Chimura, Ippei; Kitazume, Keisuke; Kaneko, Yoshiyuki; Fuse, Shirou; and Ueno, Akio, 4,188,439, Cl. 428-215.000.
Asakura, Hiroshi; Chimura, Ippei; Kitazume, Keisuke; Kaneko, Yoshiyuki; Fuse, Shirou; and Ueno, Akio, 4,188,442, Cl. 428-216.000.

Kang, Hong Y.; and Bro, Per, to P. R. Mallory & Co., Inc. Internal battery fuse. 4,188,460, Cl. 429-7.000.

Kankaanpaa, Matti, to Valmet. Method for dewatering paper in a paper machine press section. 4,188,262, Cl. 162-205.000.

Kansai Paint Co., Ltd.: *See*—
Nezu, Tuguo; and Miyata, Nobuyoshi, 4,188,222, Cl. 96-115.00P.

Kapfinger, Wolfgang: *See*—
Barbieri, Siegfried; and Kapfinger, Wolfgang, 4,188,125, Cl. 356-404.000.

Kaplan, Leonard; and Cotton, Frank A., to Union Carbide Corporation. Novel solvents for the catalytic process for producing polyhydric alcohols. 4,188,335, Cl. 260-449.00L.

Kaplan, Leonard A., to RCA Corporation. RC Oscillator. 4,188,593, Cl. 331-108.00D.

Kapteyn, Robert J.: *See*—
Willner, Howard; and Kapteyn, Robert J., 4,188,188, Cl. 23-230.00B.

Karl Lautenschlager KG Mobelbeschlagfabrik: *See*—
Lautenschlager, Karl, Jr., 4,187,580, Cl. 16-145.000.

Karlin, Robert. Steadying rest to aid in steadying an artist's hand. 4,188,006, Cl. 248-118.300.

Kasho, Yoshihiro: *See*—
Nanpei, Masaru; Fujimura, Toshiaki; Kouda, Hajime; Kasho, Yoshihiro; and Etoh, Kuniomi, 4,188,221, Cl. 430-288.000.

Kasuga, Masao; Takahashi, Nobuaki; Sato, Masaaki; Seki, Kohji; Mori, Toshinori; and Iwahara, Makoto, to Victor Company of Japan, Limited. Signal processing circuit for binaural signals. 4,188,504, Cl. 179-1.0GP.

Kasugai, Tsuneo; and Kitagawa, Keishi, to Fuji Photo Film Co., Ltd. Supports for photographic paper and photographic light-sensitive material. 4,188,220, Cl. 430-536.000.

Kasuya, Takahiko: *See*—
Ohno, Tsuneo; Maeno, Kunio; Kasuya, Takahiko; and Nakajima, Takao, 4,188,424, Cl. 428-572.000.

Katagiri, Masaaki: *See*—
Takahashi, Hiroshi; Nakao, Kiyoshi; and Katagiri, Masaaki, 4,188,415, Cl. 427-97.000.

Kataoka, Akiyoshi. Process for electrolytically forming glossy film on articles of aluminum or alloy thereof. 4,188,270, Cl. 204-42.000.

Kato, Hisashi: *See*—
Iwasa, Masakazu; Kato, Hisashi; and Kudo, Yoshio, 4,187,774, Cl. 101-1.000.

Katoh, Kenji; and Ogita, Tamotu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas recirculation system of an internal combustion engine. 4,187,811, Cl. 123-119.00A.

Kautzky, Norbert. Connecting arrangement for the detachable mounting of a binding on skis. 4,188,044, Cl. 280-611.000.

Kawaguchi, Masashi: *See*—
Mizukami, Etsuo; Kishishita, Hiroshi; Kawaguchi, Masashi; Endo, Yoshihiro; and Isaka, Kinichi, 4,188,565, Cl. 313-509.000.

Kawai, Jun; Homma, Jun-ichi; Watanabe, Saburo; and Watanabe, Masahiro, to Nippon Electric Co., Ltd.; and Fuji Industry Co., Ltd. Roll electrode for use in a seam welding machine. 4,188,523, Cl. 219-83.000.

Kawai, Syuji: *See*—
Yamauchi, Kazuhisa; Tanaka, Taku; and Kawai, Syuji, 4,188,117, Cl. 356-237.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Komatsu, Tadaomi, 4,187,949, Cl. 212-58.00R.
Komatsu, Tadaomi, 4,187,949, Cl. 212-58.00R.
Takagi, Izumi; and Adachi, Shigeo, 4,187,732, Cl. 74-230.17M.

Kawasaki, Mitsuru: *See*—
Morishita, Masanobu; Inoue, Hidehiko; Ando, Takao; and Kawasaki, Mitsuru, 4,188,642, Cl. 358-213.000.

Kay, Charles. Beverage product and process. 4,188,409, Cl. 426-78.000.

Kazami, Shin-Ichi; and Doi, Toshitada, to Sony Corporation. Method and system for transmitting and receiving blocks of encoded data words to minimize error distortion in the recovery of said data words. 4,188,616, Cl. 340-146.1AL.

Kazda, Stanislav: *See*—
Bossert, Friedrich; Wehinger, Egbert; Meyer, Horst; Heise, Arend; Kazda, Stanislav; Stoepel, Kurt; Towart, Robertson; Vater, Wulf; and Schlossmann, Klaus, 4,188,395, Cl. 424-266.000.

Keiper Automobiltechnik GmbH & Co KG: *See*—
Gensicke, Walter, 4,187,579, Cl. 16-139.000.

Keller, Richard L.: *See*—
Westover, Jack D.; and Keller, Richard L., 4,187,771, Cl. 99-404.000.

Kelly, Michael: *See*—
Grylls, Frederick S. M.; Rennie, Stanley D.; and Kelly, Michael, 4,188,407, Cl. 426-62.000.

Kempter, Fritz E.; Schupp, Eberhard; and Blum, Rainer, to BASF Aktiengesellschaft. Surface-coating binders and their use for cathodic electrocoating. 4,188,312, Cl. 260-19.0EP.

Kendall Company, The: *See*—
Bonk, Joseph P., 4,187,960, Cl. 222-107.000.
Layton, Terry N., 4,187,722, Cl. 73-229.000.
Taylor, Glenn N., 4,187,848, Cl. 128-247.000.
Villari, Frank K., 4,187,860, Cl. 128-763.000.

Kennedy, Richard W.: *See*—
Chang, Mike F.; Roesch, Alfred; and Kennedy, Richard W., 4,188,245, Cl. 148-188.000.

Kerr, James D., to Teledyne Industries Inc. (Geotech Division). Piezoelectric seismometer. 4,188,612, Cl. 367-160.000.

Kewanee Industries, Inc.: *See*—
Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 4,188,293, Cl. 210-47.000.

Khudoian, Korjun L.: *See*—
Sarkisian, Levon A.; Matsoian, Stepan G.; Gabzimalian, Vagram G.; Mailian, Shaen M.; Galstian, Albert P.; Azarian, Vazgen K.; Ter-Davtian, Zorik S.; Gevorkian, Raya G.; Gevorkian, Ogden A.; Khudoian, Korjun L.; Ovsepian, Lavrenty A.; Arutjunova, Amalia A.; and Mkrtchian, Foerbakh V., 4,188,406, Cl. 426-3.000.

Kido, Keishiro; Yoshida, Satoshi; and Ikeda, Tomoaki, to Fuji Photo Film Co., Ltd. Recording material. 4,188,214, Cl. 430-494.000.

Kilby, Jack S.; McKee, William R.; and Porter, Wilbur A., to Texas Instruments Incorporated. System for fabrication of semiconductor bodies. 4,188,177, Cl. 425-5.000.

Killian, Gerald I. Folding limb compound archery bow. 4,187,826, Cl. 124-24.00R.

Kim, Young J.: *See*—
Lyons, Bernard J.; and Kim, Young J., 4,188,276, Cl. 204-159.170.

Kimball International, Inc.: *See*—
Robinson, John W.; and Howell, Stephen L., 4,187,756, Cl. 84-1.240.
Kimbro, Robert M. Adjustable stabilizer for motor vehicles and the like. 4,188,049, Cl. 280-766.000.
Kimura, Takeo: *See*—
Akashi, Kageyasu; Hayashi, Yoshio; Arakawa, Tatsumi; Kimura, Takeo; and Kobayashi, Hidehiko, 4,188,226, Cl. 430-620.000.
Kinetics, Inc.: *See*—
Zahora, Edward P.; and Zahora, Edward, Jr., 4,187,833, Cl. 126-312.000.
King, Donald A., to Abex Corporation. Flow proportional conveyor drive system. 4,187,958, Cl. 222-57.000.
Kintz, Glenn W. Animal trap for capturing burrowing animals. 4,187,634, Cl. 43-61.000.
Kirchmayr, Rudolf: *See*—
Felder, Louis; and Kirchmayr, Rudolf, 4,188,224, Cl. 204-159.150.
Kirkpatrick, Alan D., to Corrugated Development, Inc. Web handling apparatus. 4,188,257, Cl. 156-504.000.
Kirkpatrick, David B.: *See*—
Jones, Harry S.; Kirkpatrick, David B.; and Wilson, Robert G., 4,187,779, Cl. 102-18.00M.
Kirmaier, N.: *See*—
Reis, A.; Kirmaier, N.; and Schoberl, M., 4,188,278, Cl. 204-268.000.
Kishishita, Hiroshi: *See*—
Mizukami, Etsuo; Kishishita, Hiroshi; Kawaguchi, Masashi; Endo, Yoshihiro; and Isaka, Kinichi, 4,188,565, Cl. 313-509.000.
Kissich, Arnulf; and Sussenbacher, Florian, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Mining machine having walk-on platform on cutter arm. 4,188,069, Cl. 299-73.000.
Kitagawa, Keishi: *See*—
Kasugai, Tsuneo; and Kitagawa, Keishi, 4,188,220, Cl. 430-536.000.
Kitazume, Keisuke: *See*—
Asakura, Hiroshi; Chimura, Ippei; Kitazume, Keisuke; Kaneko, Yoshiyuki; Fuse, Shirou; and Ueno, Akio, 4,188,439, Cl. 428-215.000.
Asakura, Hiroshi; Chimura, Ippei; Kitazume, Keisuke; Kaneko, Yoshiyuki; Fuse, Shirou; and Ueno, Akio, 4,188,442, Cl. 428-216.000.
Kitchin, Oscar G., to General Motors Corporation. Unit handled roller clutch subassembly. 4,187,937, Cl. 192-45.000.
Kitt, Edward A. Gravel spreader. 4,188,152, Cl. 404-110.000.
Klausing, Thomas A.: *See*—
Talbert, Sherwood G.; Klausing, Thomas A.; and Yates, Jan B., 4,188,172, Cl. 417-53.000.
Klein, Hans, deceased: *See*—
Clemens, Kurt; and Klein, Hans, deceased, 4,188,140, Cl. 403-13.000.
Kleinknecht, Hans P., to RCA Corporation. Optically measuring the carrier concentration in a semiconductor. 4,188,123, Cl. 356-354.000.
Klie, Wolfgang: *See*—
Bauer, Wilhelm; Heinrich, Kurt; Klie, Wolfgang; Rau, Wolfgang; and Trost, Werner, 4,188,059, Cl. 296-188.000.
Kliewer, Aron, Jr., to Fleetwood Enterprises, Inc. Structural members and joints between such members. 4,187,653, Cl. 52-98.000.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Raue, Reimund, 4,187,987, Cl. 239-585.000.
Klootwyk, Ronald I., to Continental Group, Inc., The. Power module assembly with monopolar cells. 4,188,462, Cl. 429-68.000.
Knauer, Karl, to Siemens Aktiengesellschaft. Process for the operation of a transversal filter. 4,188,597, Cl. 333-165.000.
Knetsch, Manfred: *See*—
Peters, Klaus-Jurgen; Nusser, Hermann; and Knetsch, Manfred, 4,188,144, Cl. 403-104.000.
Knight, Charles E., Jr.; and Pollard, Roy E., to United States of America, Energy. Rim for rotary inertial energy storage device and method. 4,187,738, Cl. 74-572.000.
Knoll, William C., to GTE Sylvania Incorporated. Direct drive ballast circuit. 4,188,660, Cl. 363-49.000.
Knopf, Robert J.: *See*—
Smith, Oliver W.; Koleske, Joseph V.; and Knopf, Robert J., 4,188,477, Cl. 528-288.000.
Knorr-Bremse GmbH: *See*—
Hintner, Josef; and Stauble, Georg, 4,188,072, Cl. 303-69.000.
Knowles, Coyle E.: *See*—
Johnson, Jesse R., 4,188,012, Cl. 251-173.000.
Knowles, Robert G., to Litton Systems, Inc. Flat cable connector with strain relief and two-position latch. 4,188,083, Cl. 339-99.00R.
Knox, Dennis M., to Post Office. Rear feed assemblies for aerials. 4,188,632, Cl. 343-753.000.
Knudsen, Poul U.: *See*—
Andersen, Axel; Knudsen, Poul U.; and Jensen, Knud B., 4,188,088, Cl. 350-96.230.
Knutson, Richard A. Bone compression or distraction device. 4,187,841, Cl. 128-92.00E.
Kobayashi, Hidehiko: *See*—
Akashi, Kageyasu; Hayashi, Yoshio; Arakawa, Tatsumi; Kimura, Takeo; and Kobayashi, Hidehiko, 4,188,226, Cl. 430-620.000.
Kobayashi, Toshihiko; and Oonishi, Toshinari, to Toyota Jidosha Kogyo Kabushiki Kaisha. Intake fuel mixture heating system for internal combustion engine. 4,187,815, Cl. 123-122.00H.
Koberstein, Edgar: *See*—
Volker, Herbert; Koberstein, Edgar; Bozon, Alfred; and Hensel, Jorg, 4,188,309, Cl. 252-466.00J.
Koegel, Ralph A., to Borg Textile Corporation. Latch guard and deep pile fabric circular knitting machine fitted therewith. 4,187,700, Cl. 66-111.000.
Koernig, Wolfgang: *See*—
Fischer, Roman; Fliege, Werner; Koernig, Wolfgang; and Meissner, Bernd, 4,188,344, Cl. 260-590.00E.
Koester, Eberhard: *See*—
Becker, Hans-Juergen; Jaeckh, Christof; Koester, Eberhard; Loeser, Werner; Ohlinger, Manfred; and Steck, Werner, 4,188,302, Cl. 252-62.560.
Koh-I-Noor Rapidograph, Inc.: *See*—
Anderka, Gerold; and Jozat, Walter, 4,188,634, Cl. 346-1.100.
Kohler, Raymond H.: *See*—
Bower, Bruce L.; and Kohler, Raymond H., 4,188,661, Cl. 363-49.000.
Kohler, William J.: *See*—
Vicik, Stephen J.; Kohler, William J.; and Funderburk, James O., Jr., 4,188,350, Cl. 525-232.000.
Kohmoto, Osamu: *See*—
Yamaguchi, Norishige; Ohya, Kazuo; Kohmoto, Osamu; and Fujishima, Hiroki, 4,188,211, Cl. 75-170.000.
Kohno, Kazuo: *See*—
Yamaguchi, Yasumasa; and Kohno, Kazuo, 4,188,339, Cl. 260-561.00N.
Kohno, Toshihiko: *See*—
Tsukamoto, Goro; Yoshino, Koichiro; Kohno, Toshihiko; Taguchi, Masahiro; Dezawa, Katsumi; Kagaya, Hajime; Ito, Keiso; and Nose, Takashi, 4,188,486, Cl. 546-271.000.
Koizumi, Michio: *See*—
Mizutani, Nagao; Sawada, Takashi; Okawara, Yasuo; Koizumi, Michio; and Kurihara, Toshio, 4,188,135, Cl. 400-214.000.
Koleske, Joseph V.: *See*—
Smith, Oliver W.; Koleske, Joseph V.; and Knopf, Robert J., 4,188,477, Cl. 528-288.000.
Komatsu, Tadaomi, to Kawasaki Jukogyo Kabushiki Kaisha; and Kawasaki Jukogyo Kabushiki Kaisha. Derrick crane with wide horizontal swinging range of boom. 4,187,949, Cl. 212-58.00R.
Kondo, Kiyoshi; and Matsui, Kiyohide, to FMC Corporation. Process for converting 2,2-dichlorovinylcyclopropanes to dibromovinyl analogs. 4,188,492, Cl. 562-506.000.
Kondo, Wakichi: *See*—
Fujii, Kinjiro; Kondo, Wakichi; and Kumagai, Toshiya, 4,188,370, Cl. 423-579.000.
Koniger, Rudolf: *See*—
Frischmann, Albert; Mermi, Kurt; and Koniger, Rudolf, 4,187,757, Cl. 85-80.000.
Koppensteiner, James V.; Jameel, Khaja M.; Kubik, Charles K.; and Len, George, to GTE Automatic Electric Laboratories Incorporated. Tool and method for installing flexible tubing in a multi-capsule reed relay switching assembly. 4,187,604, Cl. 29-622.000.
Korbach, Paul F.: *See*—
Bosniack, David S.; and Korbach, Paul F., 4,188,500, Cl. 585-1.000.
Koren, Paul P.: *See*—
Patel, Jayant M.; Wolfe, Jerome K.; and Koren, Paul P., 4,188,514, Cl. 200-48.00R.
Kossler, Erich. Hydraulic turbine with vertical axis. 4,188,546, Cl. 290-52.000.
Kouda, Hajime: *See*—
Nanpei, Masaru; Fujimura, Toshiaki; Kouda, Hajime; Kasho, Yoshihiro; and Etoh, Kuniomi, 4,188,221, Cl. 430-288.000.
Kovacs, Jozsef P., to Baker International Corporation. Well bore apparatus with annulus pressure releasable tubing seal unit. 4,187,906, Cl. 166-120.000.
Kovats, Ervin; Demole, Edouard; Ohloff, Gunther; and Stoll, Max, deceased (by Stoll, Suzanne, executrix), to Firmenich SA. Cycloaliphatic unsaturated ketones as odor and taste modifying agents in tobacco products. 4,187,863, Cl. 131-17.00R.
Krall, Harry J.: *See*—
Lu, Chen-i; Krall, Harry J.; and Osmers, Herman R., 4,188,449, Cl. 428-314.000.
Kraus, Bernd: *See*—
Schnurle, Hans; Mayer, Rudi; and Kraus, Bernd, 4,187,806, Cl. 123-32.0EE.
Kreonite, Inc.: *See*—
Marvin, Roger L., 4,188,111, Cl. 355-37.000.
Marvin, Roger L., 4,188,115, Cl. 355-75.000.
Kreuter, Walter: *See*—
Wernicke, Hans J.; Watson, Allan; Kreuter, Walter; Mansmann, Manfred; and Weber, Horst, 4,188,281, Cl. 208-57.000.
Krezanoski, Joseph Z., to Cooper Laboratories, Inc. Clear, water-miscible, liquid pharmaceutical vehicles and compositions which gel at body temperature for drug delivery to mucous membranes. 4,188,373, Cl. 424-78.000.
Krisak, Edward J.; and Strozak, Stephen, to FMC Corporation. Bulkhead shaft seal. 4,188,039, Cl. 277-95.000.
Kroeger, Edward R., to Warner Electric Brake & Clutch Company. Method of making an electrically released electromagnetic friction brake. 4,187,603, Cl. 29-602.00R.
Krulik, Gerald A.: *See*—
Bauer, Randy L.; and Krulik, Gerald A., 4,188,227, Cl. 106-1.270.
Kruske, Gerhard, to Metallgesellschaft Aktiengesellschaft. Nickel-base alloy. 4,188,209, Cl. 75-122.000.
Kubicek, Donald H., to Phillips Petroleum Company. Sulfolene hydrogenation. 4,188,327, Cl. 549-87.000.

Kubik, Charles K.: *See*—
Koppensteiner, James V.; Jameel, Khaja M.; Kubik, Charles K.; and Len, George, 4,187,604, Cl. 29-622.000.

Kubota, Ltd.: *See*—
Yamada, Hirofumi; Takaki, Noboru; and Masuda, Michio, 4,187,616, Cl. 34-13.000.

Kudo, Yoshio: *See*—
Iwasa, Masakazu; Kato, Hisashi; and Kudo, Yoshio, 4,187,774, Cl. 101-1.000.

Kuhn, Lawrence: *See*—
Giordano, Francis P.; Kuhn, Lawrence; Lane, Ramon; Lee, Chen-Hsiung; and Zierdt, Gene O., 4,188,635, Cl. 346-75.000.

Kuhn, Ralph F., Jr., to United States of America, Air Force. Method of fabricating nozzle blades for lasers. 4,187,595, Cl. 29-157.00C.

Kuhnlein, Hans, to Hch. Bertrams Aktiengesellschaft. Heat transfer installation having storage reservoir containing a salt as a heat carrier. 4,187,904, Cl. 165-104.000.

Kuipers, Arie; and Schroder, Karl, to Meggle Milchindustrie GmbH & Co. KG. Method of preparing a protein-enriched unripened cheese composition. 4,188,411, Cl. 426-582.000.

Kukla, Michael J., to G. D. Searle & Co. 1-[(10,11-Dihydro-5H-dibenzo[a,d]-cyclohepten-5-yl)methyl]-4-substituted piperidines and related compounds. 4,188,485, Cl. 546-202.000.

Kull, George A., to ACF Industries, Incorporated. Cone valve assembly. 4,187,881, Cl. 137-625.310.

Kullendorf, Anders: *See*—
Hugosson, Evald; and Kullendorf, Anders, 4,188,458, Cl. 428-556.000.

Kumagai, Toshiya: *See*—
Fujii, Kinjiro; Kondo, Wakichi; and Kumagai, Toshiya, 4,188,370, Cl. 423-579.000.

Kumita, Norio: *See*—
Narita, Seiichi; and Kumita, Norio, 4,188,517, Cl. 200-61.45R.

Kuntzel, Heiner: *See*—
Dubs, Paul; and Kuntzel, Heiner, 4,188,488, Cl. 548-337.000.

Kuntzi, David M.: *See*—
Resa, Richard N.; and Kuntzi, David M., 4,188,058, Cl. 296-208.000.

Kunze, Hans J.: *See*—
Wolf, Franz-Josef; and Kunze, Hans J., 4,188,040, Cl. 277-207.00R.

Kuraray Co., Ltd.: *See*—
Yamauchi, Kazuhisa; Tanaka, Taku; and Kawai, Syuji, 4,188,117, Cl. 356-237.000.

Kurata, Motoji, to Japan Medical Supply Co., Ltd. Artificial lung with a built-in heat exchanger. 4,188,360, Cl. 422-46.000.

Kurath, Paul: *See*—
Tadanier, John S.; Martin, Jerry R.; and Kurath, Paul, 4,188,319, Cl. 260-112.50R.

Kurihara, Toshio: *See*—
Mizutani, Nagao; Sawada, Takashi; Okawara, Yasuo; Koizumi, Michio; and Kurihara, Toshio, 4,188,135, Cl. 400-214.000.

Kusche, David W.: *See*—
Lanpheer, Richard A.; and Kusche, David W., 4,187,809, Cl. 123-65.0EM.

Kusters, Eduard: *See*—
Appenzeller, Valentin, 4,187,594, Cl. 29-116.0AD.

L. & C. Steinmuller GmbH: *See*—
Clemens, Kurt; and Klein, Hans, deceased, 4,188,140, Cl. 403-13.000.
Dorling, Rolf, 4,187,955, Cl. 220-435.000.

LaCroix, Gene, Jr. Saddle girth. 4,187,663, Cl. 54-23.000.

Ladwig, Richard D., to Combustion Engineering, Inc. Automatic calcining kettle. 4,188,186, Cl. 432-43.000.

Laffitte, Andre: *See*—
Carville, Charles; and Laffitte, Andre, 4,188,559, Cl. 313-60.000.

Laing, Ingeborg: *See*—
Laing, Nikolaus; Laing, Ingeborg; and Laing, Oliver, 4,187,982, Cl. 237-2.00B.

Laing, Nikolaus; Laing, Ingeborg; and Laing, Oliver. Apparatus for increasing the transmission capacity of remote heating grids. 4,187,982, Cl. 237-2.00B.

Laing, Oliver: *See*—
Laing, Nikolaus; Laing, Ingeborg; and Laing, Oliver, 4,187,982, Cl. 237-2.00B.

La Marca, Giuseppe, to Intertecnica S.p.A. Closure, particularly for industrial freezer doors. 4,188,054, Cl. 292-226.000.

Lamare, Jean-Claude; and Maury, Christian, to Compagnie Internationale pour l'Informatique. Phase decoder. 4,188,620, Cl. 340-347.0DD.

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Cox, Myron K.; McGrath, William J.; and Cantrill, James E., 4,187,714, Cl. 73-9.000.
McIlwain, Irwin D., to Sperry Rand Corporation. Baler pickup counter balancing means. 4,187,666, Cl. 56-341.000.
McKee, William R.: *See—*
Kilby, Jack S.; McKee, William R.; and Porter, Wilbur A., 4,188,177, Cl. 425-5.000.
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Van Linder, Basil R.; Van Linder, Ronald C.; and McLane, Fredrick G., 4,187,966, Cl. 222-601.000.
McMullan, James P.; and Stevens, Albert. Water bed transducer. 4,187,568, Cl. 5-451.000.
Mead Corporation, The: *See—*
Wood, Prentice J., 4,187,944, Cl. 206-187.000.
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Gliemeroth, Georg; and Meckel, Lothar, 4,188,089, Cl. 350-96.340.
Medfare, Inc.: *See—*
Lum, Jackson, 4,188,550, Cl. 307-311.000.
Media Arts Workshop Inc.: *See—*
Prichett, Harry W., 4,188,100, Cl. 353-95.000.
Medtronic, Inc.: *See—*
Hepp, Dennis G.; Neumann, Robert A.; and Citron, Paul, 4,187,854, Cl. 128-419.0PG.
Meek, Nigel W.; and Ramsay, Jeffrey S., to Sperry Rand Corporation. Agricultural machine structure. 4,187,664, Cl. 56-13.600.
Meeker, Marlene F. Combination harness and coverlet for infant seats. 4,188,065, Cl. 297-485.000.
Meggle Milchindustrie GmbH & Co. KG: *See—*
Engl, Robert; and Richter, Hans, 4,188,386, Cl. 424-249.000.
Kuipers, Arie; and Schroder, Karl, 4,188,411, Cl. 426-582.000.
Mehoudar, Raphael. Pressure regulators. 4,187,873, Cl. 137-505.130.
Meijer, Dietrich E.: *See—*
Dittrich, Jurgen; Heinzerling, Jurgen; Meijer, Dietrich E.; Mollendorf, Ralf; and Wolf, Friedrich, 4,188,640, Cl. 358-111.000.
Meiji Seika Kaisha, Ltd.: *See—*
Nakamura, Takeshi; Nakabayashi, Satoru; Fukatsu, Shunzo; and Seki, Shigeo, 4,188,480, Cl. 536-17.000.
Meissner, Bernd: *See—*
Fischer, Roman; Fliege, Werner; Koernig, Wolfgang; and Meissner, Bernd, 4,188,344, Cl. 260-590.00E.
Melby, William E.; Isdale, Charles E., Sr.; and Collins, Vernon K., to A. H. Robins Company, Incorporated. Process for tempering tissue for heparin production. 4,188,467, Cl. 435-274.000.

Meli, Alberto: *See—*
Pestellini, Vittorio; Ghelardoni, Mario; Bianchini, Claudio; Del Soldato, Piero; Volterra, Giovanna; and Meli, Alberto, 4,188,323, Cl. 548-229.000.

Melnikov, Nikolai N.; Grapov, Artur F.; Razvodovskaya, Ljudmila V.; Popov, Petr V.; Sedykh, Aelita S.; Shapovalova, Galina K.; Abelentseva, Galina M.; Siforova, Tamara A.; Nikolaeva, Tatyana A.; Galitsina, Valentina V.; Stonov, Leonid D.; and Bakumenko, Ljudmila A., to Vsesojuzny Nauchno, et al. Thiazolinyl (thiazolyl) phosphonamidates and phosphoramidates pesticidal and herbicidal compositions based thereon. 4,188,382, Cl. 424-200.000.

Melvin, Lawrence S., Jr.: *See—*
Althuis, Thomas H.; Harbert, Charles A.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,188,495, Cl. 568-633.000.

Memorex Corporation: *See—*
Guerini, Albert J., 4,188,648, Cl. 360-105.000.

Menapace, Henry R., to Goodyear Tire & Rubber Company, The. Hydrogenation of cyclopentadiene to form cyclopentene. 4,188,348, Cl. 585-274.000.

Mentor Corporation: *See—*
Hauser, Thomas M., 4,187,851, Cl. 128-295.000.

Mercer, Donald G.: *See—*
DeBernard, Lewis M., Jr.; and Mercer, Donald G., 4,188,430, Cl. 428-88.000.

Mercier-Greenwood, Christiane: *See—*
Thivend, Pierre; Mercier-Greenwood, Christiane; and Guilbot, Andre, 4,188,466, Cl. 435-18.000.

Merck & Co., Inc.: *See—*
McAleer, William J.; and Hurni, William M., 4,187,989, Cl. 241-2.000.

Merck Patent Gesellschaft mit beschrankter Haftung: *See—*
Orth, Dieter; Radunz, Hans-Eckart; Baumgarth, Manfred; Maisenbacher, Jurgen; and Lissner, Reinhard, 4,188,403, Cl. 424-330.000.

Meredith, Harold F., to Meredith Manufacturing Co. Limited. Fencing construction. 4,188,019, Cl. 256-24.000.

Meredith Manufacturing Co. Limited: *See—*
Meredith, Harold F., 4,188,019, Cl. 256-24.000.

Meri, Kalju; and Allen, Richard G., to Dictaphone Corporation. Remotely controlled telephone answering apparatus. 4,188,507, Cl. 179-6.00D.

Merianos, John J.: *See—*
Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 4,188,293, Cl. 210-47.000.

Mermi, Kurt: *See—*
Frischmann, Albert; Mermi, Kurt; and Koniger, Rudolf, 4,187,757, Cl. 85-80.000.

Merrick, George J.; Cook, George E.; and Modglin, Donald D., to Merrick Welding International. Welding torch oscillation apparatus. 4,188,525, Cl. 219-125.120.

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Merrick, George J.; Cook, George E.; and Modglin, Donald D., 4,188,525, Cl. 219-125.120.

Messer Griesheim GmbH: *See—*
Schrawer, Rolf; Diehl, Werner K.; and Ringelstein, Hans M., 4,187,936, Cl. 220-465.000.

Metal Box Limited: *See—*
Throp, Arnold M., 4,188,457, Cl. 428-542.000.

Metallgesellschaft Aktiengesellschaft: *See—*
Kruske, Gerhard, 4,188,209, Cl. 75-122.000.

Metzler, Robert A., Jr. Chess word game. 4,188,035, Cl. 273-260.000.

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Bossert, Friedrich; Wehinger, Egbert; Meyer, Horst; Heise, Arend; Kazda, Stanislav; Stoepel, Kurt; Towart, Robertson; Vater, Wulf; and Schlossmann, Klaus, 4,188,395, Cl. 424-266.000.

Meyer, Thomas N.: *See—*
United States of America, National Aeronautics and Space Administration; Wolf, Charles B.; and Meyer, Thomas N., 4,188,368, Cl. 423-350.000.

Mhatre, Girish P.; and Brooks, Robert A., to Magnetic Analysis Corporation. Pulse eddy current testing apparatus for magnetic materials, particularly tubes. 4,188,577, Cl. 324-220.000.

Michlmayr, Manfred J., to Chevron Research Company. Selective process for removal of thiophenes from gasoline using a silver-exchanged faujasite-type zeolite. 4,188,285, Cl. 208-246.000.

Miciukiewicz, Joseph F., to Pitney Bowes Inc. Document handling apparatus and drive control. 4,188,028, Cl. 271-265.000.

Microtracers Inc.: *See—*
Eisenberg, Sylvan, 4,188,408, Cl. 426-74.000.

Mid-Florida Pools and Repair, Inc.: *See—*
Burnett, Willis R., 4,188,295, Cl. 210-206.000.

Midland-Ross Corporation: *See—*
Wilhelm, Larry A., 4,187,717, Cl. 73-46.000.

Midolo, Lawrence L. Liquid cooled rotary vane air cycle machine. 4,187,692, Cl. 62-402.000.

Midolo, Lawrence L. Binary working fluid air conditioning system. 4,187,694, Cl. 62-402.000.

Midrex Corporation: *See—*
Beggs, Donald; and Escott, Robert M., 4,188,022, Cl. 266-195.000.

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Thuillier, Germaine, born Nachmias; and Mignonac, Sylviane S. J., born Mondon, 4,188,388, Cl. 424-250.000.

Mikhailov, Gennady G.: *See—*
Bobrovnikov, Anatoly P.; Zakharov, Alexandr V.; Soloviev, Gennady I.; Mikhailov, Gennady G.; Golubeva, Tamara N.; and Glushkova, Nina N., 4,187,652, Cl. 52-90.000.

Miles Laboratories, Inc.: *See—*
Shemer, Michael, 4,188,399, Cl. 426-276.000.

Miller, Bruce H., to Simco Company, Inc., The. Light-shielded extended-range static eliminator. 4,188,530, Cl. 250-324.000.

Miller, Clarence S., Jr.; and Hager, Richard A., to Hercofina. Heat exchange apparatus. 4,187,902, Cl. 165-76.000.

Miller, David L.: *See—*
Nicolai, Carl R.; Raike, William M.; and Miller, David L., 4,188,580, Cl. 325-32.000.

Miller, Donald L., to Facet Enterprises, Inc. Electromagnetic clutch with anti-jam cam actuation. 4,187,938, Cl. 192-54.000.

Miller, Gary M.: *See—*
Campoli, Ralph F.; Barrieres, Elie L.; Bannat, John W.; Steiner, Edwin G.; Lynch, Thomas A.; and Miller, Gary M., 4,187,783, Cl. 102-93.000.

Miller, Larence G.; and Purmal, Rowland B. Garbage can alarm. 4,188,622, Cl. 340-571.000.

Miller, Leroy J.: *See—*
Bilow, Norman; Landis, Abraham L.; and Miller, Leroy J., 4,188,337, Cl. 260-465.00D.

Millgardh, Ulf J.; Lindberg, Ulf W.; Anneflod, Weimar A.; Werner, Nils H.; and Wimelius, Bjorn, to Orebro Pappersbruks AB. Producing a continuous flexible sheet covering material for wrapping heat, cold and sound insulation. 4,188,248, Cl. 156-164.000.

Milosevic, Ljubimko, to Thomson-CSF. Method of and system for avoiding collisions between aircraft. 4,188,630, Cl. 343-9.00R.

Minoura, Mikio: *See—*
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, 4,187,816, Cl. 123-139.0AW.

Mioduski, Victoria F. Personal urinal device for females. 4,187,562, Cl. 4-144.300.

Mislin, Roland; and Steiner, Karl-Ulrich, to Sandoz Ltd. Dyeing of polyamide textiles and anthraquinone dyestuffs therefor. 4,188,187, Cl. 8-39.00B.

Mitchell, Lawrence C.: *See—*
Jaquiss, Donald B. G.; and Mitchell, Lawrence C., 4,188,496, Cl. 568-723.000.

Mitchell, Robert W. Photographic print processing system. 4,188,107, Cl. 354-328.000.

Mitscher, Lester A.; Clark, George W., III; and Bokelman, Gordon H., to Abbott Laboratories. Intermediates for the preparation of prostaglandins and prostaglandin analogs from a mold metabolite. 4,188,329, Cl. 260-343.30P.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Abiru, Hisanori; Nakao, Yoshiaki; Imamura, Yoshiaki; and Sada, Hidetaka, 4,187,614, Cl. 33-174.00L.

Mitsui Petrochemical Industries, Ltd.: *See—*
Yoshioka, Toshihiro; Itaya, Shikiho; Arima, Yusaku; and Tanaka, Hirokazu, 4,188,365, Cl. 423-239.00A.

Miura, Michiyori, to Hitachi, Ltd. Elastic surface wave device. 4,188,596, Cl. 333-151.000.

Miwa, Hirohide; and Terakawa, Toshiaki, to Fujitsu Limited. Method for detecting coordinates of gas discharge panels and apparatus for carrying out the same. 4,188,566, Cl. 315-169.400.

Miyata, Nobuyoshi: *See—*
Nezu, Tuguo; and Miyata, Nobuyoshi, 4,188,222, Cl. 96-115.00P.

Mizukami, Etsuo; Kishishita, Hiroshi; Kawaguchi, Masashi; Endo, Yoshihiro; and Isaka, Kinichi, to Sharp Kabushiki Kaisha. Oxygen atom containing film for a thin-film electroluminescent element. 4,188,565, Cl. 313-509.000.

Mizusawa Kagaku Kogyo Kabushiki Kaisha: *See—*
Sugahara, Yujiro; Noshi, Yoshibumi; Naito, Hiroyuki; Takahashi, Akira; Ito, Masanori; and Tuchida, Hisashi, 4,188,268, Cl. 204-2.100.

Mizutani, Nagao; Sawada, Takashi; Okawara, Yasuo; Koizumi, Michio; and Kurihara, Toshio, to Citizen Watch Co., Ltd. Multiple inked ribbon color changeover mechanism for printing machine. 4,188,135, Cl. 400-214.000.

Mkrtchian, Foerbakh V.: *See—*
Sarkisian, Levon A.; Matsoian, Stepan G.; Gabzimalian, Vagram G.; Mailian, Shaen M.; Galstian, Albert P.; Azarian, Vazgen K.; Ter-Davtian, Zorik S.; Gevorkian, Raya G.; Gevorkian, Ogden A.; Khudoian, Korjun L.; Ovsepian, Lavrenty A.; Arutjunova, Amalia A.; and Mkrtchian, Foerbakh V., 4,188,406, Cl. 426-3.000.

Mndzhoian, Oganes L.; Avetisian, Svetlana A.; Akopian, Nina E.; and Gerasimian, Dzhemma A. Method for treating epilepsy. 4,188,398, Cl. 424-274.000.

Mobil Oil Corporation: *See—*
Chang, Clarence D.; and Lang, William H., 4,188,336, Cl. 260-449.00R.
Espenscheid, Wilton F.; and Yan, Tsoung-Yuan, 4,188,235, Cl. 106-278.000.
Holmes, Billy G.; and Crofford, Jimmie, 4,188,068, Cl. 299-5.000.
Yan, Tsoung-Yuan, 4,188,279, Cl. 204-294.000.

Mobile Oil Corporation: *See—*
Tabak, Samuel A.; and Morrison, Roger A., 4,188,282, Cl. 208-134.000.

Modglin, Donald D.: *See—*
Merrick, George J.; Cook, George E.; and Modglin, Donald D., 4,188,525, Cl. 219-125.120.

Moench, Theodor P.: *See*—
Hanstein, Friedrich; Moench, Theodor P.; and Schreyer, Gunter, 4,188,425, Cl. 428-34.000.
Moertel, George B., to Textron Inc. Method of manufacturing slide fastener stringers. 4,187,791, Cl. 112-265.200.
Mole-Richardson Co.: *See*—
Aron, Daniel L., 4,188,658, Cl. 362-396.000.
Mollendorf, Ralf: *See*—
Dittrich, Jurgen; Heinzerling, Jurgen; Meijer, Dietrich E.; Mollendorf, Ralf; and Wolf, Friedrich, 4,188,640, Cl. 358-111.000.
Mollering, Hans: *See*—
Schneider, Walter; Roder, Albert; Mollering, Hans; and Gutmann, Ingeborg, 4,188,465, Cl. 435-12.000.
Momiyama, Kikuo, to Canon Kabushiki Kaisha. Retrofocus type wide-angle objective lens. 4,188,092, Cl. 350-214.000.
Monarch Marking Systems, Inc.: *See*—
Grass, Joseph J., 4,188,250, Cl. 156-253.000.
Grass, Joseph J.; and Monarch Marking Systems, Inc., 4,188,251, Cl. 156-248.000.
Grass, Joseph J., 4,188,427, Cl. 428-41.000.
Moncur, Marlowe V.: *See*—
Woodbrey, James C.; and Moncur, Marlowe V., 4,188,223, Cl. 430-270.000.
Monk, Gaines W., to Commonwealth Scientific Corporation. Method and apparatus for transporting workpieces. 4,187,801, Cl. 118-729.000.
Mono-Med, Inc.: *See*—
Stach, Paul E.; and Sherrin, Thomas P., 4,187,890, Cl. 141-27.000.
Monroe, Tex K., to GTE Sylvania Incorporated. Constant-current vertical amplifier. 4,188,567, Cl. 315-396.000.
Monsanto Company: *See*—
Chupp, John P., 4,188,342, Cl. 260-578.000.
Woodbrey, James C.; and Moncur, Marlowe V., 4,188,223, Cl. 430-270.000.
Montedison S.p.A.: *See*—
Collina, Amilcare; Soverini, Arrigo; and Rosati, Francesco, 4,188,470, Cl. 526-64.000.
Montgomery, John A., to United States of America, Health, Education and Welfare. Anticancer and antiviral activity of 9-β-D-arabinofuranosyl-2-fluoroadenine. 4,188,378, Cl. 424-180.000.
Montgomery, Kenneth F.: *See*—
McClean, Arthur J.; and Montgomery, Kenneth F., 4,188,545, Cl. 250-561.000.
Moody, Roy A.: *See*—
Fulton, Ronald T.; and Moody, Roy A., 4,188,004, Cl. 248-74.0PB.
Moore, Donald C.: *See*—
Faulkner, Bobby P.; and Moore, Donald C., 4,188,287, Cl. 209-168.000.
Moran, Robert D.: *See*—
Masters, Blake W.; and Moran, Robert D., 4,188,570, Cl. 318-616.000.
Moreau, Claude; and Schreder, Rene, to Ateliers et Chantiers de Bretagne-A.C.B. Small size telemanipulator. 4,188,166, Cl. 414-735.000.
Mori, Ikuo; and Yoshida, Kenichi, to Kabushiki Kaisha Komatsu Seisakusho. Control mechanism for hydraulic system. 4,187,737, Cl. 74-471.0XY.
Mori, Sanae, to Daido Metal Company Ltd. Multiple-layer metal bearing for use in a large-size engine. 4,188,079, Cl. 308-237.00R.
Mori, Toshinori: *See*—
Kssuga, Masao; Takahashi, Nobuaki; Sato, Masaaki; Seki, Kohji; Mori, Toshinori; and Iwahara, Makoto, 4,188,504, Cl. 179-1.0GP.
Morinaga, Teruhiko; and Nishikawa, Ikuo, to Toyo Kogyo Co., Ltd. Weather-tight seal structures for automobile windows. 4,187,642, Cl. 49-406.000.
Moring, James M., to Eastman Kodak Company. Electrical chemical process for the removal of hexavalent chromium from aqueous medium. 4,188,272, Cl. 204-149.000.
Morishita, Masanobu; Inoue, Hidehiko; Ando, Takao; and Kawasaki, Mitsuru, to Nippon Electric Co., Ltd. CCD Imager operable in single frame and repetitive frame modes. 4,188,642, Cl. 358-213.000.
Morita, Takashi: *See*—
Iwanaga, Sadaaki; Morita, Takashi; Nakamura, Shin; Takahashi, Kenji; and Niwa, Makoto, 4,188,264, Cl. 23-230.00B.
Moritz, Alfred: *See*—
Regler, Dieter; Sitrl, Erhard; and Moritz, Alfred, 4,187,827, Cl. 125-16.00R.
Moritz, Frederick G.: *See*—
Mosciatti, Roger; Foley, Thomas P.; and Moritz, Frederick G., 4,187,997, Cl. 242-182.000.
Morrell, Ronald J.; Gumb, Beverley W.; and Dragunevicius, Algirdas J., to Northern Telecom Limited. Electret microphone with simplified electrical connections by printed circuit board mounting. 4,188,513, Cl. 179-111.00E.
Morrison, Roger A.: *See*—
Tabak, Samuel A.; and Morrison, Roger A., 4,188,282, Cl. 208-134.000.
Mosciatti, Roger; Foley, Thomas P.; and Moritz, Frederick G. Vacuum control system for magnetic tape handler. 4,187,997, Cl. 242-182.000.
Moshofsky, Jerome F.: *See*—
Harris, Richard D.; Smith, Franklin G.; and Moshofsky, Jerome F., 4,187,590, Cl. 24-73.00P.
Moss, Philip H.: *See*—
Waddill, Harold G.; and Moss, Philip H., 4,188,474, Cl. 528-111.000.
Motorola, Inc.: *See*—
Brown, Kenneth H.; Carr, Michael E.; and Rook, Charles W., 4,188,589, Cl. 331-12.000.
Cannalte, Gary A.; Chapman, Ronald H.; and Rozanski, Walter J., Jr., 4,188,582, Cl. 325-58.000.
Flowers, Dervin L.; Greeson, Richard L.; and Rice, V. Louise, 4,187,599, Cl. 29-588.000.
Johnson, Robert H., 4,188,629, Cl. 343-6.50R.
Palmer, James R., 4,188,587, Cl. 330-136.000.
Motosugi, Katsuhiko: *See*—
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, 4,187,816, Cl. 123-139.0AW.
Mott, Gerald, to Westinghouse Electric Corp. Low frequency hydrophone. 4,188,609, Cl. 367-152.000.
Mounteer, Carlyle A.; and Poteet, Ronald L., to Gulton Industries, Inc. Process for fabricating strain gage transducer. 4,188,258, Cl. 156-628.000.
Mouzin, Gilbert: *See*—
Pitet, Guy; Cousse, Henri; Mouzin, Gilbert; and Stenger, Antoine, 4,188,387, Cl. 424-249.000.
Mowill, Jan. Impeller element or radial inflow gas turbine wheel. 4,188,169, Cl. 416-185.000.
Moyer, Rudolph H.: *See*—
Allen, Richard T.; Moyer, Rudolph H.; Sibbett, Donald J.; Anderson, Howard H.; Martner, Glen R.; and Willis, Don, 4,187,836, Cl. 128-2.080.
Allen, Richard T.; Moyer, Rudolph H.; Sibbett, Donald J.; Anderson, Howard H.; Martner, Glen R.; and Willis, Don, 4,187,859, Cl. 128-725.000.
Mueller, Walter B.; Schirmer, Henry G.; Schoenberg, Julian H.; and Weinberg, Alan S., to W. R. Grace & Co. Multi-layer polyester/-polyolefin shrink film. 4,188,443, Cl. 428-216.000.
Mukai, Yositaka: *See*—
Saruwatari, Teturo; and Mukai, Yositaka, 4,187,895, Cl. 157-1.550.
Munari, Stelio; Vigo, Fernando; Capannelli, Gustavo; Uliana, Claudio; and Bottino, Aldo, to Tecneco S.p.A. Method for the preparation of asymmetrical membranes. 4,188,354, Cl. 264-22.000.
Munchow, Peter; and Kaiser, Walter, to International Standard Electric Corporation. Tone signalling arrangement for a telecommunications exchange. 4,188,509, Cl. 179-18.0AD.
Muntean, George L.: *See*—
Wilson, Harry L.; Shultz, David E.; and Muntean, George L., 4,187,817, Cl. 123-139.0AW.
Murakami, Takeshi: *See*—
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Murakami, Toshio; Noda, Masaru; Nabeyama, Hiroaki; and Murakami, Takeshi, to Hitachi, Ltd. Video synchronous detector apparatus. 4,188,639, Cl. 358-25.000.
Muraki, Ryoji; Takemura, Shinichiro; Ohashi, Yoshio; and Ichioka, Athushi, to Tokyo Shibaura Electric Co., Ltd.; and Tokyo Shibaura Electric Co. Ltd. Input control method and means for nitrogen oxide removal means. 4,188,190, Cl. 23-232.00R.
Murata, Atsuo; Tsuchiya, Shuji; Suzuki, Hideo; and Ikeda, Hisao, to Nissan Chemical Industries, Ltd. Process for producing linalool. 4,188,498, Cl. 568-875.000.
Murphy, Wesley T., to E.T.I. Corporation. Quick set clip for partition studs. 4,188,147, Cl. 403-230.000.
N.A.D., Inc.: *See*—
Schreiber, Peter J., 4,187,842, Cl. 128-202.220.
N. V. Hollandse Signaalapparaten: *See*—
Hoogstraate, Hendrik, 4,188,584, Cl. 325-446.000.
Nabeyama, Hiroaki: *See*—
Murakami, Toshio; Noda, Masaru; Nabeyama, Hiroaki; and Murakami, Takeshi, 4,188,639, Cl. 358-25.000.
Nagai, Kazumasa, to Ryobi, Ltd. Paper sheet feeding device. 4,188,026, Cl. 271-148.000.
Nagano, Kazuo: *See*—
Sakoda, Ryozo; Hashiba, Isao; and Nagano, Kazuo, 4,188,343, Cl. 260-571.000.
Nagatanien Honpo Co., Ltd.: *See*—
Yoshimura, Tetsuya, 4,187,798, Cl. 116-206.000.
Nagel, Dennis M.; O'Neal, Douglas; Petroskey, Paul W.; van den Berg, Jan W.; Wildes, Donald V.; and Wu, David C., to International Business Machines Corporation. Programmable communications subsystem. 4,188,665, Cl. 364-200.000.
Naito, Hiroyuki: *See*—
Sugahara, Yujiro; Noshi, Yoshibumi; Naito, Hiroyuki; Takahashi, Akira; Ito, Masanori; and Tuchida, Hisashi, 4,188,268, Cl. 204-2.100.
Nakabayashi, Satoru: *See*—
Nakamura, Takeshi; Nakabayashi, Satoru; Fukatsu, Shunzo; and Seki, Shigeo, 4,188,480, Cl. 536-17.000.
Nakajima, Takao: *See*—
Ohno, Tsuneo; Maeno, Kunio; Kasuya, Takahiko; and Nakajima, Takao, 4,188,424, Cl. 428-572.000.
Nakamoto, Hiromasa: *See*—
Pernet, Andre G.; Nakamoto, Hiromasa; and Ishizuka, Naoyasu, 4,188,331, Cl. 260-343.600.
Nakamura, Shin: *See*—
Iwanaga, Sadaaki; Morita, Takashi; Nakamura, Shin; Takahashi, Kenji; and Niwa, Makoto, 4,188,264, Cl. 23-230.00B.
Nakamura, Shozo: *See*—
Tsuji, Kunio; Hisano, Katsukuni; Sakai, Akira; and Nakamura, Shozo, 4,187,685, Cl. 60-660.000.

Nakamura, Takeshi; Nakabayashi, Satoru; Fukatsu, Shunzo; and Seki, Shigeo, to Meiji Seika Kaisha, Ltd. Process for the production of a 9,3''-di-acyl derivative of a macrolide antibiotic. 4,188,480, Cl. 536-17.000.

Nakao, Kiyoshi: *See*—
Takahashi, Hiroshi; Nakao, Kiyoshi; and Katagiri, Masaaki, 4,188,415, Cl. 427-97.000.

Nakao, Yoshiaki: *See*—
Abiru, Hisanori; Nakao, Yoshiaki; Imamura, Yoshiaki; and Sada, Hidetaka, 4,187,614, Cl. 33-174.00L.

Nakatsu, Daniel T. Rope-suspended shelving unit. 4,187,787, Cl. 108-96.000.

Nakatsubo, Toshio; Nishikawa, Masaji; and Sato, Eiichi, to Olympus Optical Co., Ltd. Device for manufacturing photosensitive screen. 4,187,800, Cl. 118-724.000.

Nalco Chemical Company: *See*—
Adams, Paul G.; and Gebler, Kenneth A., 4,188,416, Cl. 427-135.000.
Reven, Frederick V., 4,188,229, Cl. 106-68.000.

Nanda, Vinod K., to Gould Inc. Overload relief valve. 4,187,763, Cl. 91-176.000.

Nanpei, Masaru; Fujimura, Toshiaki; Kouda, Hajime; Kasho, Yoshihiro; and Etoh, Kuniomi, to Toyo Boseki Kabushiki Kaisha. Photosensitive polyamide resin composition useful for making relief printing plate. 4,188,221, Cl. 430-288.000.

Nanya, Takanori: *See*—
Nishimura, Katsuo; and Nanya, Takanori, 4,188,095, Cl. 350-357.000.

Napoli, Joseph L., Jr.: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; Napoli, Joseph L., Jr.; and Onisko, Bruce L., 4,188,345, Cl. 568-665.000.

Narita, Seiichi; and Kumita, Norio, to Nippondenso Co., Ltd. Collision detecting inertia switch. 4,188,517, Cl. 200-61.45R.

Naruse, Tunehide; Sasaki, Yasushi; and Matsumoto, Yukio, to Victor Company of Japan, Limited. Magnetic recording composition. 4,188,301, Cl. 252-62.540.

Nasser, Benny E., Jr.; and Delap, Joseph A., to Phillips Petroleum Company. Organochromium on titanium-impregnated base as olefin polymerization catalyst. 4,188,471, Cl. 526-96.000.

National Cellulose Corporation: *See*—
Boyer, Harold, 4,187,983, Cl. 239-9.000.

National Distillers and Chemical Corporation: *See*—
Hinnenkamp, James A.; and Scheben, John A., 4,188,490, Cl. 560-245.000.

National Institute for Metallurgy: *See*—
Edwards, Roderick I.; Loo, Joe P.; and Ossin, David I., 4,188,362, Cl. 423-22.000.

National Semiconductor Corporation: *See*—
Burns, Carmen D., 4,188,438, Cl. 428-209.000.

Naumann, Reinhard. Apparatus for laterally positioning sheets in printing machines or the like. 4,188,027, Cl. 271-241.000.

NCR Corporation: *See*—
Patel, Rashmikant R., 4,188,456, Cl. 428-530.000.
Rauscher, Tomlinson G., 4,188,669, Cl. 364-900.000.

Nederlandse Organisatie Voor Toegepast-Natuurwetenschappe-Lijk Onderzoek Ten Behoeve Van Nijverheid, Handel En-Verkeer: *See*—
Voerman, Simon; Persoons, Cornelis J.; and Ritter, Fridolin J., 4,188,374, Cl. 424-84.000.

Nedila, Walter. Device for use in picking berries. 4,187,665, Cl. 56-330.000.

Needham, Riley B.: *See*—
Cornelius, Archie J.; and Needham, Riley B., 4,187,910, Cl. 166-305.00R.

Neefe, Charles W. Method of making aspheric lenses. 4,188,353, Cl. 264-1.000.

Nelson, David E., to Hydroacoustics, Inc. Method of and apparatus for the generation and transmission of signals for echolocation and other signalling purposes, such as in geophysical exploration. 4,188,610, Cl. 367-14.000.

Nelson, Donald L., to Dow Chemical Company, The. High temperature polymers. 4,188,473, Cl. 528-86.000.

Nelson, Donald W.: *See*—
Thiewes, Richard B.; and Nelson, Donald W., 4,188,644, Cl. 360-14.000.

Nelson, John J.: *See*—
Ippoliti, Ralph J.; and Nelson, John J., 4,187,703, Cl. 70-63.000.

Nelson, Norman A., to Upjohn Company, The. Phenyl-substituted 5,6-dihydro-prostacyclin analogs. 4,188,468, Cl. 542-429.000.

Nelson Research & Development Company: *See*—
Eakins, Kenneth E.; and Bhattacherjee, Parimal, 4,188,394, Cl. 424-262.000.

Netzer, Henry A. Large sailboat visibility improvements. 4,188,093, Cl. 350-303.000.

Neumann, Peter, to Sandoz Ltd. Treating spastic conditions or relaxing muscles. 4,188,393, Cl. 424-258.000.

Neumann, Robert A.: *See*—
Hepp, Dennis G.; Neumann, Robert A.; and Citron, Paul, 4,187,854, Cl. 128-419.0PG.

Nevins, Robert L. Method and apparatus for manufacturing a solar energy collector. 4,187,596, Cl. 29-157.30C.

Nevitt, James S., to Bendix Corporation, The. Method and apparatus for dimensional gaging with fluid pressure. 4,187,715, Cl. 73-37.900.

Newalls Insulation Company Limited: *See*—
Graham, Robert; and Hall, Philip S., 4,188,355, Cl. 264-26.000.

Newmont Exploration Limited: *See*—
Guay, Wilbur J., 4,188,208, Cl. 75-105.000.

Newton, Paul P.: *See*—
Silvestrini, Richard L.; and Newton, Paul P., 4,187,939, Cl. 192-84.00C.

Nezu, Tuguo; and Miyata, Nobuyoshi, to Kansai Paint Co., Ltd. Photocurable composition containing an N-nitrosodiarylamine. 4,188,222, Cl. 96-115.00P.

Nicholson, John S.; and Turner, John L., to Boots Company Limited, The. Preparation of therapeutic compounds. 4,188,491, Cl. 562-492.000.

Nicolai, Carl R.; Raike, William M.; and Miller, David L., to Telesync Corporation. Secure communication system. 4,188,580, Cl. 325-32.000.

Nielsen, Edwin A., to Ideal Toy Corporation. Toy vehicle. 4,187,637, Cl. 46-262.000.

Nihon Dixie Company, Limited: *See*—
Suzuki, Shoichi, 4,187,768, Cl. 93-39.10R.

Nikolaeva, Tatyana A.: *See*—
Melnikov, Nikolai N.; Grapov, Artur F.; Razvodovskaya, Ljudmila V.; Popov, Petr V.; Sedykh, Aelita S.; Shapovalova, Galina K.; Abelentseva, Galina M.; Siforova, Tamara A.; Nikolaeva, Tatyana A.; Galitsina, Valentina V.; Stonov, Leonid D.; and Bakumenko, Ljudmila A., 4,188,382, Cl. 424-200.000.

Nippon Electric Co., Ltd.: *See*—
Kawai, Jun; Homma, Jun-ichi; Watanabe, Saburo; and Watanabe, Masahiro, 4,188,523, Cl. 219-83.000.
Morishita, Masanobu; Inoue, Hidehiko; Ando, Takao; and Kawasaki, Mitsuru, 4,188,642, Cl. 358-213.000.
Okano, Yasunobu, 4,187,670, Cl. 58-23.00R.
Sato, Susumu; and Shiba, Hiroshi, 4,188,636, Cl. 357-71.000.
Tan, Yoichi, 4,188,615, Cl. 340-146.10R.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Sawada, Shuichi, 4,188,316, Cl. 260-40.00R.

Nippon Kokan Kabushiki Kaisha: *See*—
Takahashi, Nobuhiro; and Hirata, Kenichi, 4,188,243, Cl. 148-155.000.

Nippon Soken, Inc.: *See*—
Egami, Tsuneyuki, 4,188,586, Cl. 329-192.000.

Nippon Steel Corporation: *See*—
Watanabe, Kunio; and Hashimoto, Yoshio, 4,188,241, Cl. 148-12.00F.

Nippondenso Co., Ltd.: *See*—
Narita, Seiichi; and Kumita, Norio, 4,188,517, Cl. 200-61.45R.

Nirasawa, Mitsuharu: *See*—
Fujiwara, Masato; Nirasawa, Mitsuharu; and Takeda, Keiji, 4,188,212, Cl. 430-69.000.

Nishikawa, Ikuo: *See*—
Morinaga, Teruhiko; and Nishikawa, Ikuo, 4,187,642, Cl. 49-406.000.

Nishikawa, Masaji: *See*—
Nakatsubo, Toshio; Nishikawa, Masaji; and Sato, Eiichi, 4,187,800, Cl. 118-724.000.

Nishikawa, Yashuhisa: *See*—
Kanai, Takao; and Nishikawa, Yashuhisa, 4,187,729, Cl. 74-10.900.

Nishimura, Katsuo; and Nanya, Takanori, to Citizen Watch Co., Ltd. Liquid type display cells and method of manufacturing the same. 4,188,095, Cl. 350-357.000.

Nissan Chemical Industries, Ltd.: *See*—
Murata, Atsuo; Tsuchiya, Shuji; Suzuki, Hideo; and Ikeda, Hisao, 4,188,498, Cl. 568-875.000.
Sakoda, Ryozo; Hashiba, Isao; and Nagano, Kazuo, 4,188,343, Cl. 260-571.000.

Nissan Motor Company, Limited: *See*—
Hosaka, Akio; and Aono, Shigeo, 4,187,812, Cl. 123-119.0EC.
Yama, Toshio; and Shimizu, Kazuaki, 4,188,074, Cl. 303-92.000.

Nissel, Gunthard: *See*—
Schenck, Karl-Wilhelm; Nissel, Gunthard; and Schuster, Erich, 4,188,119, Cl. 356-252.000.

Nitto Chemical Industry Co., Ltd.: *See*—
Yamaguchi, Yasumasa; and Kohno, Kazuo, 4,188,339, Cl. 260-561.00N.

Niwa, Makoto: *See*—
Iwanaga, Sadaaki; Morita, Takashi; Nakamura, Shin; Takahashi, Kenji; and Niwa, Makoto, 4,188,264, Cl. 23-230.00B.

NL Industries, Inc.: *See*—
Hochsprung, Dennis H.; Wright, Alan C.; Annas, Robert I.; and Purcell, Pat W., 4,188,624, Cl. 340-606.000.

Noda, Masaru: *See*—
Murakami, Toshio; Noda, Masaru; Nabeyama, Hiroaki; and Murakami, Takeshi, 4,188,639, Cl. 358-25.000.

Nopanen, Esko J., to General Electric Company. Food grinder. 4,187,993, Cl. 241-89.200.

Norman, James L.; and Mayhall, Donald J., to Falconbridge Nickel Mines Limited. Metallurgical process using liquid fuels. 4,188,204, Cl. 75-11.000.

North Oakland Development Corporation: *See*—
Blachura, Leon, 4,187,659, Cl. 52-745.000.

Northern Telecom Limited: *See*—
Morrell, Ronald J.; Gumb, Beverley W.; and Dragunevicius, Algirdas J., 4,188,513, Cl. 179-111.00E.

Northrop, Richard A., Jr.; and Wanat, David J., to Century Brass Products, Inc. Thermal power element with safety lockup. 4,187,683, Cl. 60-527.000.

Norton, Charlie L., to Dan River Inc. Drive mechanism for a sewing machine puller wheel. 4,187,795, Cl. 112-318.000.

Nose, Takashi: *See*—
Tsukamoto, Goro; Yoshino, Koichiro; Kohno, Toshihiko; Taguchi, Masahiro; Dezawa, Katsumi; Kagaya, Hajime; Ito, Keiso; and Nose, Takashi, 4,188,486, Cl. 546-271.000.
Noshi, Yoshibumi: *See*—
Sugahara, Yujiro; Noshi, Yoshibumi; Naito, Hiroyuki; Takahashi, Akira; Ito, Masanori; and Tuchida, Hisashi, 4,188,268, Cl. 204-2.100.
NTN Toyo Bearing Co. Ltd.: *See*—
Tsukumo, Zenzaburo, 4,187,588, Cl. 19-281.000.
Nusser, Hermann: *See*—
Peters, Klaus-Jurgen; Nusser, Hermann; and Knetsch, Manfred, 4,188,144, Cl. 403-104.000.
Nuwayser, Elie S.; and Barrington, James E., to Abcor, Inc. Implantable penile prosthesis. 4,187,839, Cl. 128-79.000.
N.V. Hollandse Signaalapparaten: *See*—
Langeraar, Huibert B.; and Van Rooijen, Gerrit, 4,188,628, Cl. 343-5.0SA.
NYA AB Nyhems Mekaniska Verkstad: *See*—
Rex, Gert I., 4,187,995, Cl. 242-107.40A.
Nyce, Andrew C. Implantable teeth and method of making. 4,187,608, Cl. 433-201.000.
Nyman, Bengt E. Power regenerative transmission. 4,187,741, Cl. 74-751.000.
Occidental Petroleum Corporation: *See*—
Longanbach, James R.; and Robinson, Leon, 4,188,191, Cl. 44-1.00F.
O'Connor, Robert J., to Bell Telephone Laboratories, Incorporated. Modular jack converter. 4,188,505, Cl. 179-1.0PC.
Ogee Alsthom: *See*—
Cailloux, Michel, 4,188,659, Cl. 363-37.000.
Ogita, Tamotu: *See*—
Katoh, Kenji; and Ogita, Tamotu, 4,187,811, Cl. 123-119.00A.
Ohashi, Yoshio: *See*—
Muraki, Ryoji; Takemura, Shinichiro; Ohashi, Yoshio; and Ichioka, Athushi, 4,188,190, Cl. 23-232.00R.
O'Hern, Thomas R. Brake operated shift lock. 4,187,935, Cl. 192-4.00A.
Ohkura, Yosuke: *See*—
Kamachi, Shinichi; and Ohkura, Yosuke, 4,188,320, Cl. 260-202.000.
Ohlinger, Manfred: *See*—
Becker, Hans-Juergen; Jaeckh, Christof; Koester, Eberhard; Loeser, Werner; Ohlinger, Manfred; and Steck, Werner, 4,188,302, Cl. 252-62.560.
Ohloff, Gunther: *See*—
Kovats, Ervin; Demole, Edouard; Ohloff, Gunther; and Stoll, Max, deceased, 4,187,863, Cl. 131-17.00R.
Ohlson, John F. Coupling for misaligned shafts. 4,187,698, Cl. 64-9.00R.
Ohmura, Ryuichi, to Fuji Kogyo Co., Ltd. Reel seat for fishing rods. 4,187,633, Cl. 43-22.000.
Ohninata, Ichiro, to Hitachi, Ltd. Semiconductor switching circuit. 4,188,548, Cl. 307-252.00C.
Ohno, Tsuneo; Maeno, Kunio; Kasuya, Takahiko; and Nakajima, Takao, to Toyoda Gosei Co., Ltd. Metal carrier for trim. 4,188,424, Cl. 428-572.000.
Ohno, Yukihiro: *See*—
Idenawa, Hiroyuki; Tanzawa, Misao; and Ohno, Yukihiro, 4,188,109, Cl. 355-3.0FU.
Ohtsuki, Tomonari: *See*—
Inouye, Hiromasa; Ohtsuki, Tomonari; and Igarashi, Yoshiaki, 4,188,086, Cl. 339-176.0MF.
Ohya, Kazuo: *See*—
Yamaguchi, Norishige; Ohya, Kazuo; Kohmoto, Osamu; and Fujishima, Hiroki, 4,188,211, Cl. 75-170.000.
Oil-Dri Corporation of America: *See*—
Valenta, Rudolph C., 4,187,803, Cl. 119-1.000.
Okamoto, Kouji: *See*—
Urry, Dan W.; and Okamoto, Kouji, 4,187,852, Cl. 128-334.00R.
Okamura, Masatoshi; and Shiba, Haruo, to TDK Electronics Company, Limited. Tape cassette. 4,187,998, Cl. 242-199.000.
Okano, Yasunobu, to Nippon Electric Co., Ltd. Time signal generator circuit for use in an electronic timepiece. 4,187,670, Cl. 58-23.00R.
Okawa, Tadashi; Honbu, Mitsuyuki; and Matsuda, Yasuo, to Hitachi, Ltd. Protective device of a current source inverter. 4,188,663, Cl. 363-51.000.
Okawara, Yasuo: *See*—
Mizutani, Nagao; Sawada, Takashi; Okawara, Yasuo; Koizumi, Michio; and Kurihara, Toshio, 4,188,135, Cl. 400-214.000.
Oliver, Leland W.: *See*—
Selvin, Gerald J.; Oliver, Leland W.; Yamamoto, Stephen K.; and Hogan, Clarence V., 4,187,605, Cl. 29-629.000.
Olmstead, Edward A., to Black Bocs, Ltd. Computer performance measurement device and process. 4,187,726, Cl. 73-660.000.
Olowinski, Edward J.; and Foster, Leonard W., to Lord Corporation. Adjustable support system. 4,187,668, Cl. 57-130.000.
Olsson, Hans O. Lockable swivel coupling. 4,188,142, Cl. 403-31.000.
Olympus Optical Co., Ltd.: *See*—
Fujii, Toru, 4,188,091, Cl. 350-201.000.
Nakatsubo, Toshio; Nishikawa, Masaji; and Sato, Eiichi, 4,187,800, Cl. 118-724.000.
Omnetics, Inc.: *See*—
Lambert, Roger T., 4,187,745, Cl. 81-9.510.
Omura, Yoshio: *See*—
Yoshikumi, Chikao; Omura, Yoshio; and Hotta, Tetsuya, 4,188,384, Cl. 424-180.000.
O'Neal, Douglas: *See*—
Nagel, Dennis M.; O'Neal, Douglas; Petroskey, Paul W.; van den Berg, Jan W.; Wildes, Donald V.; and Wu, David C., 4,188,665, Cl. 364-200.000.
O'Neil, Scott M.; and Payne, Howard H., to United States of America, Navy. Bi-metallic thermal compensator for mounting a solid propellant grain. 4,187,676, Cl. 60-255.000.
Onisko, Bruce L.: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; Napoli, Joseph L., Jr.; and Onisko, Bruce L., 4,188,345, Cl. 568-665.000.
Ono, Tomoyuki. Molding process for a natural fruit of a fruit-tree or vegetable, a molding frame therefor and molded above fruit. 4,187,639, Cl. 47-58.000.
Oonishi, Toshinari: *See*—
Kobayashi, Toshihiko; and Oonishi, Toshinari, 4,187,815, Cl. 123-122.00H.
Oranje, Pieter J. D.: *See*—
Huizer, Leendert; Van Namen, Dirk J.; and Oranje, Pieter J. D., 4,188,497, Cl. 568-799.000.
Orebro Pappersbruks AB: *See*—
Millgardh, Ulf J.; Lindberg, Ulf W.; Anneflod, Weimar A.; Werner, Nils H.; and Wimelius, Bjorn, 4,188,248, Cl. 156-164.000.
Orr Felt Company, The: *See*—
Diehl, Pieter S., 4,187,618, Cl. 34-243.00F.
Orth, Dieter; Radunz, Hans-Eckart; Baumgarth, Manfred; Maisenbacher, Jurgen; and Lissner, Reinhard, to Merck Patent Gesellschaft mit beschrankter Haftung. Cyclopentan-1-amines. 4,188,403, Cl. 424-330.000.
Ortho Pharmaceutical Corporation: *See*—
Wachter, Michael P., 4,188,328, Cl. 260-340.90R.
Osmers, Herman R.: *See*—
Lu, Chen-i; Krall, Harry J.; and Osmers, Herman R., 4,188,449, Cl. 428-314.000.
Ossberger, Karl: *See*—
Linss, Gerhard; and Ossberger, Karl, 4,188,179, Cl. 425-531.000.
Ossberger Turbinenfabrik: *See*—
Linss, Gerhard; and Ossberger, Karl, 4,188,179, Cl. 425-531.000.
Ossin, David I.: *See*—
Edwards, Roderick I.; Loo, Joe P.; and Ossin, David I., 4,188,362, Cl. 423-22.000.
Oswald, Alexis A., to Exxon Research & Engineering Co. Surface active quaternary higher dialkyl phosphonium salt biocides and intermediates. 4,188,380, Cl. 424-198.000.
Ott, Anton: *See*—
Hamma, Karlmann; Ott, Anton; Vetter, Werner; and Chatterjee, Arun, 4,187,739, Cl. 74-732.000.
Outboard Marine Corporation: *See*—
Hansen, Loren F., 4,188,164, Cl. 414-447.000.
Ovsepian, Lavrenty A.: *See*—
Sarkisian, Levon A.; Matsoian, Stepan G.; Gabzimalian, Vagram G.; Mailian, Shaen M.; Galstian, Albert P.; Azarian, Vazgen K.; Ter-Davtian, Zorik S.; Gevorkian, Raya G.; Gevorkian, Ogden A.; Khudoian, Korjun L.; Ovsepian, Lavrenty A.; Arutjunova, Amalia A.; and Mkrtchian, Foerbakh V., 4,188,406, Cl. 426-3.000.
Owens-Corning Fiberglas Corporation: *See*—
Foley, Kevin M.; and Hill, Homer G., 4,188,454, Cl. 428-391.000.
Owens-Illinois, Inc.: *See*—
Berg, Charles A., 4,187,688, Cl. 62-2.000.
Boling, Norman L., 4,188,238, Cl. 136-89.0FC.
Boling, Norman L., 4,188,239, Cl. 136-89.0FC.
Go, Santos W., 4,188,357, Cl. 264-540.000.
Owens, William W.: *See*—
Froning, H. Robert; Owens, William W.; and Archer, Duane L., 4,187,907, Cl. 166-275.000.
P. R. Mallory & Co., Inc.: *See*—
Kang, Hong Y.; and Bro, Per, 4,188,460, Cl. 429-7.000.
Pace Incorporated: *See*—
Vella, Alexander J., 4,187,972, Cl. 228-20.000.
Packaging Systems, Inc.: *See*—
Cochran, Donald D., 4,187,662, Cl. 53-381.00A.
Pagano, Carmine N.; and Di'Giorgio, Anthony D., to United States of America, Army. Digital data communications system. 4,188,503, Cl. 178-88.000.
Palau, Joseph, to S.A. des Etablissements Staubli. Dobby for the formation of the shed on looms. 4,187,886, Cl. 139-68.000.
Palmer, Ansell W.; and Stevens, Francis J., to General Electric Company. Key operated meter access lock and reset mechanism. 4,188,575, Cl. 324-103.00R.
Palmer, James R., to Motorola, Inc. Linear gain control apparatus utilizing feed forward level control. 4,188,587, Cl. 330-136.000.
Panduit Corp.: *See*—
Fulton, Ronald T.; and Moody, Roy A., 4,188,004, Cl. 248-74.0PB.
Panlaqui, Clayton E.: *See*—
Holt, Lloyd J.; and Panlaqui, Clayton E., 4,187,761, Cl. 89-1.50R.
Papa, Franco, to Societa Italiana Telecomunicazioni Siemens S.p.A. Inductance coil for telecommunication system and method of making same. 4,188,599, Cl. 333-219.000.
Parker-Hannifin Corporation: *See*—
Burge, Donald G., 4,188,051, Cl. 285-104.000.
Pasanen, Pertti. Means for accelerating the speed on a ski jump. 4,188,018, Cl. 254-175.300.
Pasini, Arnaldo; Dalmasso, Claudio; Brescia, Riccardo; and Bosio, Roberto, to Ing. C. Olivetti & C., S.p.A. Method and apparatus for correctably printing characters with sublimable ink. 4,188,139, Cl. 400-696.000.

Pasternack, Adalbert: *See*—
Warncke, Ernst; and Pasternack, Adalbert, 4,187,843, Cl. 128-202.260.
Patel, Jayant M.; Wolfe, Jerome K.; and Koren, Paul P., to Westinghouse Electric Corp. Telescoping disconnect switch with gasketed covered access port. 4,188,514, Cl. 200-48.00R.
Patel, Jayant M.; and Farley, James R., to Westinghouse Electric Corp. Telescoping disconnect switch with low resistance center conductor. 4,188,515, Cl. 200-48.00R.
Patel, Jayant M.; Wolfe, Jerome K.; and Coyle, Forrest E., to Westinghouse Electric Corp. Telescoping disconnect switch with high current contact system. 4,188,516, Cl. 200-48.00R.
Patel, Rashmikant R., to NCR Corporation. Pressure-sensitive recording sheet. 4,188,456, Cl. 428-530.000.
Patuzzi, Alexander; and Eysn, Manfred, to Voest-Alpine Aktiengesellschaft. Metallurgical vessel cooling and safety system. 4,188,021, Cl. 266-88.000.
Pauley, Eugene E. Fireplace heat exchanger assembly. 4,187,829, Cl. 126-121.000.
Pauli, Harry P. Retractable patio assembly for recreational vehicle. 4,188,057, Cl. 296-162.000.
Paulus, Cornelia A.; and Paulus, Nancy E. Garment for use after breast surgery. 4,187,855, Cl. 128-427.000.
Paulus, Nancy E.: *See*—
Paulus, Cornelia A.; and Paulus, Nancy E., 4,187,855, Cl. 128-427.000.
Pauly, Ronald R., to Tonka Corporation. Camping trailer. 4,187,636, Cl. 46-201.000.
Pawley, Jess W., to London Concrete Machinery Co. Mixing blades of concrete mixing drums. 4,188,127, Cl. 366-44.000.
Pawlow, Roy E., to Litton Industrial Products, Inc. Quick release mechanism for socket wrench. 4,187,747, Cl. 81-177.00G.
Payne, David T.; and Brand, Boris P., to Imperial Chemical Industries Limited. Stable liquid compositions containing salts of 1,2-benzisothiazolin-3-one. 4,188,376, Cl. 424-173.000.
Payne, Howard H.: *See*—
O'Neil, Scott M.; and Payne, Howard H., 4,187,676, Cl. 60-255.000.
Pederson, Brian L.; and Pederson, Stephen F. Log trailer assembly. 4,188,042, Cl. 280-404.000.
Pederson, Stephen F.: *See*—
Pederson, Brian L.; and Pederson, Stephen F., 4,188,042, Cl. 280-404.000.
Peet, Gale P. Gas can transporter. 4,187,950, Cl. 414-421.000.
Pegel, Karl H., to Roecar Holdings (Netherlands Antilles) N.V. Sterolins and their use. 4,188,379, Cl. 424-182.000.
Pelton, Peter G., to Continental Group, Inc., The. Propellantless aerosol dispensing system. 4,187,959, Cl. 222-94.000.
Pennella, Filippo: *See*—
Rycheck, Mark R.; and Pennella, Filippo, 4,188,501, Cl. 585-643.000.
Percarpio, Edward P., to Becton, Dickinson and Company. Cannula pierceable, self-sealing closure. 4,187,952, Cl. 215-247.000.
Pereira, Joseph K.; and White, Martin, to British Steel Corporation. Regenerators. 4,187,900, Cl. 165-8.000.
Peripheral Dynamics, Inc.: *See*—
Schisselbauer, John C.; Garczynski, John S.; Auchinleck, Richard J.; and LoFurno, Henry J., 4,187,980, Cl. 235-474.000.
Perkin-Elmer Corporation, The: *See*—
Hall, Lawrence G.; and Whistler, Wayne J., 4,187,856, Cl. 128-635.000.
Perkins Engines Limited: *See*—
Herenius, Frederik J., 4,187,678, Cl. 60-321.000.
Perkins, Gerald S., to California Institute of Technology. Wear resistant valve. 4,188,174, Cl. 417-432.000.
Perkins, William C., to Rockwell International Corporation. Transformer arrangement for coupling a communication signal to a three-phase power line. 4,188,619, Cl. 340-310.00R.
Permacor, Inc.: *See*—
Tsoutsas, Peter A., 4,188,603, Cl. 336-75.000.
Pernet, Andre G.; Nakamoto, Hiromasa; and Ishizuka, Naoyasu, to Abbott Laboratories. Prostaglandin derivatives. 4,188,331, Cl. 260-343.600.
Perrella, Emilio. Pill-box display stand. 4,187,948, Cl. 211-71.000.
Persoons, Cornelis J.: *See*—
Voerman, Simon; Persoons, Cornelis J.; and Ritter, Fridolin J., 4,188,374, Cl. 424-84.000.
Pestellini, Vittorio; Ghelardoni, Mario; Bianchini, Claudio; Del Soldato, Piero; Volterra, Giovanna; and Meli, Alberto, to A. Menarini S.A.S. Derivatives of 2-oxazolydone and methods for preparing the same. 4,188,323, Cl. 548-229.000.
Peters, Klaus-Jurgen; Nusser, Hermann; and Knetsch, Manfred, to Robert Bosch GmbH. Mechanism for holding and guiding a pivoting member. 4,188,144, Cl. 403-104.000.
Peterson, John M.: *See*—
Hall, William C.; and Peterson, John M., 4,188,232, Cl. 106-97.000.
Peterson, Ted S. Tire traction device. 4,187,894, Cl. 152-222.000.
Peterson, Warren E., to Wilshire Bedding Co., Inc. Water mattress construction. 4,187,566, Cl. 5-451.000.
Petrini Poli, Denis, to Babbitless. Unloading. 4,187,991, Cl. 241-33.000.
Petro, John D.: *See*—
Hodgson, Robert F.; and Petro, John D., 4,187,877, Cl. 137-596.000.
Petrocci, Alfonso N.: *See*—
Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 4,188,293, Cl. 210-47.000.
Petrolite Corporation: *See*—
Martin, Robert B., 4,188,277, Cl. 204-190.000.
Quinlan, Patrick M., 4,188,359, Cl. 422-12.000.
Petroskey, Paul W.: *See*—
Nagel, Dennis M.; O'Neal, Douglas; Petroskey, Paul W.; van den Berg, Jan W.; Wildes, Donald V.; and Wu, David C., 4,188,665, Cl. 364-200.000.
Petrovic, John E., to Teledyne Industries, Inc. Sprayer. 4,187,986, Cl. 239-449.000.
Petruccelli, Guy S., to Ensign-Bickford Company. Detonating cord and blasting cap connector block. 4,187,780, Cl. 102-28.00R.
Petty, Jon, to United States of America, Army. Bomb container with gravity-closed internal door. 4,187,758, Cl. 86-1.00B.
Pfizer Inc.: *See*—
Althuis, Thomas H.; Harbert, Charles A.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,188,495, Cl. 568-633.000.
Campbell, Simon F., 4,188,390, Cl. 424-251.000.
Campbell, Simon F.; Danilewicz, John C.; Ham, Allan L.; and Stubbs, John K., 4,188,391, Cl. 424-251.000.
Sciavolino, Frank C., 4,188,479, Cl. 536-9.000.
Phelan, Michael B.; and White, Jack M., to ACF Industries, Incorporated. Altitude compensation apparatus. 4,187,814, Cl. 123-119.0EC.
Phelps, Francis E., to Dresser Industries, Inc. Varied pitch rotary rock bit. 4,187,922, Cl. 175-374.000.
Philagro: *See*—
Ducret, Jacques; Gaulliard, Jean-Michel; and Vial, Jean, 4,188,381, Cl. 424-199.000.
Farge, Daniel; Leboul, Jean; Le Goff, Yves; and Poiget, Gilbert, 4,188,203, Cl. 71-90.000.
Phillips, Charles E.: *See*—
Walther, William D.; and Phillips, Charles E., 4,187,733, Cl. 74-342.000.
Phillips Petroleum Company: *See*—
Cornelius, Archie J.; and Needham, Riley B., 4,187,910, Cl. 166-305.00R.
DeShon, Wallace E., 4,188,664, Cl. 364-200.000.
Kubicek, Donald H., 4,188,327, Cl. 549-87.000.
Nasser, Benny E., Jr.; and Delap, Joseph A., 4,188,471, Cl. 526-96.000.
Rycheck, Mark R.; and Pennella, Filippo, 4,188,501, Cl. 585-643.000.
Phillips, Ronald, to Lucas Industries Limited. Fuel injection pumping apparatus for internal combustion engines including manifold pressure device. 4,187,818, Cl. 123-140.00R.
Phillips Screw Company: *See*—
Simmons, Frederick A., 4,187,892, Cl. 145-50.00A.
Photomatrix Corporation: *See*—
Gensike, Karl H.; and Sam, Ronald, 4,188,114, Cl. 355-54.000.
Picciotti, Michael F.: *See*—
Boser, Ronald J.; Siegel, Walter P.; and Picciotti, Michael F., 4,187,792, Cl. 112-286.000.
Pierre Fabre S.A.: *See*—
Pitet, Guy; Cousse, Henri; Mouzin, Gilbert; and Stenger, Antoine, 4,188,387, Cl. 424-249.000.
Pilkington Brothers Limited: *See*—
Landau, Manfred, 4,188,444, Cl. 428-428.000.
Pillsbury Company, The: *See*—
Westover, Jack D.; and Keller, Richard L., 4,187,771, Cl. 99-404.000.
Pitet, Guy; Cousse, Henri; Mouzin, Gilbert; and Stenger, Antoine, to Pierre Fabre S.A. Amino-aryl 1,24-triazines useful in the treatment of diverse pain. 4,188,387, Cl. 424-249.000.
Pitney Bowes Inc.: *See*—
Miciukiewicz, Joseph F., 4,188,028, Cl. 271-265.000.
Pittinger, Charles B., Jr. Filament wound perforate plate system. 4,187,598, Cl. 29-513.000.
Plains Chemical Development Co.: *See*—
Budnick, Edward G., 4,188,234, Cl. 106-267.000.
Plantsch, Josef: *See*—
Winterholler, Johann; Plantsch, Josef; Stockl, Herbert; and Gunther, Siegfried, 4,187,968, Cl. 226-92.000.
Plascor Incorporated: *See*—
Feig, Stephen; and Vincent, William T., 4,187,786, Cl. 108-64.000.
Pohjola, Jorma. Endless belt and roll assembly for vehicles or conveyers. 4,188,076, Cl. 305-29.000.
Poiget, Gilbert: *See*—
Farge, Daniel; Leboul, Jean; Le Goff, Yves; and Poiget, Gilbert, 4,188,203, Cl. 71-90.000.
Poiry, William R. Building siding removal and reinstallation system. 4,187,661, Cl. 52-748.000.
Polaroid Corporation: *See*—
Biber, Conrad H.; Johnson, Bruce K.; and Whiteside, George D., 4,188,103, Cl. 354-27.000.
Erlichman, Irving, 4,188,105, Cl. 354-202.000.
Powers, Sheldon D., 4,188,098, Cl. 352-130.000.
Poling, Ronald W., to General Electric Company. Assembly and method of assembling. 4,188,145, Cl. 403-112.000.
Pollard, Roy E.: *See*—
Knight, Charles E., Jr.; and Pollard, Roy E., 4,187,738, Cl. 74-572.000.
Polygauge Industries Ltd.: *See*—
Maybee, Richard C., 4,188,604, Cl. 337-377.000.

Polymer Corporation, The: *See*—
Goebel, Charles V., Jr., 4,188,478, Cl. 528-314.000.
Pommier, Lorenzo A. Power generator utilizing elevation-temperature differential. 4,187,686, Cl. 60-647.000.
Poplin, James E. Construction unit. 4,187,650, Cl. 52-57.000.
Popov, Petr V.: *See*—
Melnikov, Nikolai N.; Grapov, Artur F.; Razvodovskaya, Ljudmila V.; Popov, Petr V.; Sedykh, Aelita S.; Shapovalova, Galina K.; Abelentseva, Galina M.; Siforova, Tamara A.; Nikolaeva, Tatyana A.; Galitsina, Valentina V.; Stonov, Leonid D.; and Bakumenko, Ljudmila A., 4,188,382, Cl. 424-200.000.
Popova, Ljudmila A.: *See*—
Gavrev, Valery S.; Goncharuk, Jury M.; Birjukov, Sergei B.; Savitsky, Alexandr V.; and Popova, Ljudmila A., 4,187,725, Cl. 73-613.000.
Portelli, Mario; DellaBella, Davide; Cervato, Giuseppe; and Marca, Gianfranco, to Clesa S.p.A. Derivatives of the D-threo-1-phenyl-2-trifluoroacetamido-1,3-propandediol. 4,188,402, Cl. 424-324.000.
Porter, Wilbur A.: *See*—
Kilby, Jack S.; McKee, William R.; and Porter, Wilbur A., 4,188,177, Cl. 425-5.000.
Post Office: *See*—
Knox, Dennis M., 4,188,632, Cl. 343-753.000.
Poteet, Ronald L.: *See*—
Mounteer, Carlyle A.; and Poteet, Ronald L., 4,188,258, Cl. 156-628.000.
Pouli, Dirk: *See*—
Adams, Robert G.; Pouli, Dirk; Ridgley, Dana H.; and Stephens, Donald E., 4,188,464, Cl. 429-210.000.
Power Systems Development Corporation: *See*—
Hoinski, Walter W., 4,187,797, Cl. 116-87.000.
Hoinski, Walter W., 4,187,834, Cl. 126-425.000.
Powers, Sheldon D., to Polaroid Corporation. Photographic film cassette having bowed spring with device preventing overstressing of spring. 4,188,098, Cl. 352-130.000.
PPG Industries, Inc.: *See*—
Bartrug, Norman G., 4,188,435, Cl. 428-167.000.
Brown, William J.; and Rowley, James R., 4,188,168, Cl. 414-786.000.
Brzozowski, Stanley F., 4,188,228, Cl. 106-50.000.
Chang, Wen-Hsuan, 4,188,472, Cl. 528-75.000.
Pranke, Walter T.; and Wilms, Manfred W., to Joslyn Mfg. and Supply Co. Station protector spark gap applique. 4,188,561, Cl. 313-325.000.
Prew, Raymond A., Jr., to Textron Inc. Stapler for an improved flexible pusher retracting member. 4,187,971, Cl. 227-125.000.
Price, Samuel T., to Enterprise Machine and Development Corporation. Yarn texturing air jet with cylindrical and planar baffles. 4,187,593, Cl. 28-254.000.
Prichett, Harry W., to Media Arts Workshop Inc. Rotary slide carrier system. 4,188,100, Cl. 353-95.000.
Pringle, William L., to Friedman, Leonard. Apparatus for bonding brake linings. 4,187,777, Cl. 100-93.0PB.
Procter & Gamble Company, The: *See*—
Halas, Linda A., 4,188,305, Cl. 252-95.000.
Product Dynamics, Ltd.: *See*—
Ippoliti, Ralph J.; and Nelson, John J., 4,187,703, Cl. 70-63.000.
Propper Manufacturing Co., Inc.: *See*—
Zwarun, Andrew A., 4,187,799, Cl. 116-217.000.
Pujol, Yves A., to S.A.T.E.M. St d Application des Techniques Electriques et Mecaniques. Machine for automatically tying the ends of tausages and the like. 4,188,053, Cl. 289-18.100.
PUMA-Sportschuhfabriken Rudolf Dassler KG: *See*—
Dassler, Armin A., 4,187,623, Cl. 36-129.000.
Purcell, Pat W.: *See*—
Hochsprung, Dennis H.; Wright, Alan C.; Annas, Robert I.; and Purcell, Pat W., 4,188,624, Cl. 340-606.000.
Purmal, Rowland B.: *See*—
Miller, Larence G.; and Purmal, Rowland B., 4,188,622, Cl. 340-571.000.
Pusch, Gunter. Apparatus for scanning an air space for detecting low-flying airplanes and flying bodies. 4,188,531, Cl. 250-334.000.
Pyreflex Corporation: *See*—
Berg, Charles A., 4,188,519, Cl. 219-10.470.
Quehen, Andre, to SECIM. Thickness control method and apparatus for a rolling mill. 4,187,707, Cl. 72-8.000.
Quick, Leonard M.; and Hensley, Albert L., Jr., to Standard Oil Company (Indiana). Process for the hydrotreating of heavy hydrocarbon streams. 4,188,284, Cl. 208-216.0PP.
Quinlan, Patrick M., to Petrolite Corporation. Thioether containing quartenary ammonium derivatives of 1,4-thiazines. 4,188,359, Cl. 422-12.000.
R. D. Bussard & Son, Inc.: *See*—
Harris, Richard D.; Smith, Franklin G.; and Moshofsky, Jerome F., 4,187,590, Cl. 24-73.00P.
Raban, Victor J.: *See*—
Bant, John A.; and Raban, Victor J., 4,188,461, Cl. 429-48.000.
Radunz, Hans-Eckart: *See*—
Orth, Dieter; Radunz, Hans-Eckart; Baumgarth, Manfred; Maisenbacher, Jurgen; and Lissner, Reinhard, 4,188,403, Cl. 424-330.000.
Ragle, Herbert U.; and DeMoss, Dean, to Burroughs Corporation. Piezoelectric servo for disk drive. 4,188,645, Cl. 360-75.000.
Raike, William M.: *See*—
Nicolai, Carl R.; Raike, William M.; and Miller, David L., 4,188,580, Cl. 325-32.000.
Rajput, Yudh V.; and Skodack, Gary J., to B. F. Goodrich Company, The. Adaptive acceleration system for vehicle skid control systems. 4,188,075, Cl. 303-106.000.
Ramsay, Jeffrey S.: *See*—
Meek, Nigel W.; and Ramsay, Jeffrey S., 4,187,664, Cl. 56-13.600.
Ramsey, Charles W. Strain relief bushing. 4,188,003, Cl. 248-56.000.
Rao, Basrur R.: *See*—
Cronson, Harry M.; Rao, Basrur R.; and Ross, Gerald F., 4,188,595, Cl. 333-113.000.
Rapson, W. Howard: *See*—
Rowlandson, Gordon; Reeve, Douglas W.; and Rapson, W. Howard, 4,188,260, Cl. 162-16.000.
Rasor Associates, Inc.: *See*—
Rasor, Ned S., 4,187,672, Cl. 60-39.120.
Rasor, Ned S., to Rasor Associates, Inc. Apparatus for converting carbonaceous material into fuel gases and the recovery of energy therefrom. 4,187,672, Cl. 60-39.120.
Ratliff, William K.; and Warman, Charles P., to Dana Corporation. Free floating, self-aligning shaft coupling device. 4,187,940, Cl. 192-88.00A.
Rau, Wolfgang: *See*—
Bauer, Wilhelm; Heinrich, Kurt; Klie, Wolfgang; Rau, Wolfgang; and Trost, Werner, 4,188,059, Cl. 296-188.000.
Lenart, Wolfgang; Rau, Wolfgang; and Baron, Hubertus, 4,188,132, Cl. 366-314.000.
Raue, Reimund, to Klockner-Humboldt-Deutz Aktiengesellschaft. Fuel injector. 4,187,987, Cl. 239-585.000.
Rauscher, Tomlinson G., to NCR Corporation. Decoder for variable-length codes. 4,188,669, Cl. 364-900.000.
Rautavuori, Jorma K.; and Tormala, Pertti. Method of manufacturing vitreous carbon. 4,188,369, Cl. 423-449.000.
Raychem Corporation: *See*—
Lyons, Bernard J.; and Kim, Young J., 4,188,276, Cl. 204-159.170.
Razvodovskaya, Ljudmila V.: *See*—
Melnikov, Nikolai N.; Grapov, Artur F.; Razvodovskaya, Ljudmila V.; Popov, Petr V.; Sedykh, Aelita S.; Shapovalova, Galina K.; Abelentseva, Galina M.; Siforova, Tamara A.; Nikolaeva, Tatyana A.; Galitsina, Valentina V.; Stonov, Leonid D.; and Bakumenko, Ljudmila A., 4,188,382, Cl. 424-200.000.
RCA Corporation: *See*—
Dingwall, Andrew G. F., 4,188,588, Cl. 330-253.000.
Kaplan, Leonard A., 4,188,593, Cl. 331-108.00D.
Kleinknecht, Hans P., 4,188,123, Cl. 356-354.000.
McCurdy, Robert J., 4,188,583, Cl. 325-163.000.
Reed, Robert D.: *See*—
Zink, John S.; Reed, Robert D.; and Schwartz, Robert E., 4,188,183, Cl. 431-202.000.
Reeve, Douglas W.: *See*—
Rowlandson, Gordon; Reeve, Douglas W.; and Rapson, W. Howard, 4,188,260, Cl. 162-16.000.
Regler, Dieter; Sitrl, Erhard; and Moritz, Alfred, to Wacker-Chemitronic fur Elektronic Grundstoffe mbH. Process for multiple lap cutting of solid materials. 4,187,827, Cl. 125-16.00R.
Reibling, Robert L., to Whiteway Manufacturing Co., Inc. Reflector and method of producing different, distinctive and predictable light patterns therefrom. 4,188,657, Cl. 362-348.000.
Reich, Zygmund; and Sargent, Raymond W., to Simmonds Precision Products, Inc. Incandescent lamps/fiber optic coupled vertical and scale or display. 4,188,654, Cl. 362-32.000.
Reiland, Dennis J., to General Foundry Products Corporation. Casting risers. 4,188,010, Cl. 249-197.000.
Reilly, Thomas H. M.: *See*—
Craven, John; and Reilly, Thomas H. M., 4,187,822, Cl. 123-179.00L.
Rein, Wolf-Heider, to International Standard Electric Corporation. Diskette with access cover means. 4,188,650, Cl. 360-133.000.
Reinart, Joseph: *See*—
Whaley, Kent; and Reinart, Joseph, 4,188,023, Cl. 269-228.000.
Reinhard, Russell R.; and Yaffe, Roberta, to Texaco Inc. Synthetic aircraft turbine oil. 4,188,298, Cl. 252-46.600.
Reiniger, Friedrich, to U.S. Philips Corporation. X-ray apparatus comprising a weight compensation device. 4,188,540, Cl. 250-439.00R.
Reinwall, Ernest W., Jr., to Illinois Tool Works Inc. Panel clamp. 4,187,658, Cl. 52-489.000.
Reis, A.; Kirmaier, N.; and Schoberl, M., to Institut fur Biomedizinische Technik. Apparatus for degerminating fluids. 4,188,278, Cl. 204-268.000.
Renckhoff, Gustav, deceased: *See*—
Hulsmann, Hans-Leo; and Renckhoff, Gustav, deceased, 4,188,263, Cl. 439-179.000.
Rennie, Stanley D.: *See*—
Grylls, Frederick S. M.; Rennie, Stanley D.; and Kelly, Michael, 4,188,407, Cl. 426-62.000.
Repco Limited: *See*—
Hooper, Lindsay A., 4,188,030, Cl. 272-73.000.
Reppisch-Werke Aktiengesellschaft: *See*—
Ubezio, Lorenzo, 4,188,007, Cl. 248-411.000.
Resa, Richard N.; and Kuntzi, David M. Self draining truck bed floorings. 4,188,058, Cl. 296-208.000.
Respiratory Care, Inc.: *See*—
Cambio, Orlando D., Jr., 4,187,951, Cl. 215-6.000.
Restaino, Alfred J.: *See*—
Markiewitz, Kenneth H.; and Restaino, Alfred J., 4,188,349, Cl. 525-366.000.
Reudink, Douglas O.; and Yeh, Yu S., to Bell Telephone Laboratories, Incorporated. Satellite communication system which concurrently

transmits a scanning spot beam and a plurality of fixed spot beams. 4,188,578, Cl. 325-4.000.
Reven, Frederick V., to Nalco Chemical Company. High temperature refractory caulking composition. 4,188,229, Cl. 106-68.000.
Rex, Gert I., to NYA AB Nyhems Mekaniska Verkstad. Emergency locking mechanism for seat belts. 4,187,995, Cl. 242-107.40A.
Rheinisch-Westfalisches Elektrizitatswerk AG: *See*—
Fritz, Heinz P., 4,188,269, Cl. 204-32.00R.
Rhone-Poulenc Industries: *See*—
Cerny, Jacqueline; and Vivant, Gilbert, 4,188,313, Cl. 260-37.0EP.
Rhone-Poulenc-Textile: *See*—
Braconnier, Daniel; Guillermin, Rene; and Sangalli, Sylvio, 4,188,429, Cl. 428-85.000.
Ricci, Roberto: *See*—
Aliprandi, Giovanni; Ricci, Roberto; and Timossi, Giovanni, 4,187,965, Cl. 222-600.000.
Rice, V. Louise: *See*—
Flowers, Dervin L.; Greeson, Richard L.; and Rice, V. Louise, 4,187,599, Cl. 29-588.000.
Richard, Joseph D. Fish detection apparatus. 4,188,608, Cl. 367-93.000.
Richardson, John P., to Rolls-Royce Limited. Combustion equipment for gas turbine engines. 4,187,674, Cl. 60-39.360.
Richter, Hans: *See*—
Engl, Robert; and Richter, Hans, 4,188,386, Cl. 424-249.000.
Ricoh Company, Ltd.: *See*—
Idenawa, Hiroyuki; Tanzawa, Misao; and Ohno, Yukihiro, 4,188,109, Cl. 355-3.0FU.
Ridgley, Dana H.: *See*—
Adams, Robert G.; Pouli, Dirk; Ridgley, Dana H.; and Stephens, Donald E., 4,188,464, Cl. 429-210.000.
Ridgway, Peter C.; and Case, Derek F., to Data Recording Instrument Company Limited. Manufacture of magnetic transducing heads. 4,188,247, Cl. 156-154.000.
Riester, William C.: *See*—
Deibel, Raymond A.; Gowans, Neil A.; and Riester, William C., 4,187,576, Cl. 15-250.420.
Ringelstein, Hans M.: *See*—
Schrawer, Rolf; Diehl, Werner K.; and Ringelstein, Hans M., 4,187,956, Cl. 220-465.000.
Rippelmeyer, Dennis M.; and Baysinger, Robert L., to Emerson Electric Co. Gas burner control system. 4,188,181, Cl. 431-66.000.
Rispoli, Joseph M.; Rogers, Morris A.; Sims, Rex J.; and Waitman, Reuben H., Sr., to General Foods Corporation. Foam frying. 4,188,410, Cl. 426-296.000.
Ristic-Petrovic, Spasoje. Hydraulic locking system. 4,187,704, Cl. 70-263.000.
Ritter, Fridolin J.: *See*—
Voerman, Simon; Persoons, Cornelis J.; and Ritter, Fridolin J., 4,188,374, Cl. 424-84.000.
Rivin, Evgeny I.: *See*—
Haung, Bernard; and Rivin, Evgeny I., 4,188,048, Cl. 280-688.000.
Roberson, James E.: *See*—
Hardy, James H.; and Roberson, James E., 4,187,638, Cl. 47-1.500.
Robert Bosch GmbH: *See*—
Peters, Klaus-Jurgen; Nusser, Hermann; and Knetsch, Manfred, 4,188,144, Cl. 403-104.000.
Schnurle, Hans; Mayer, Rudi; and Kraus, Bernd, 4,187,806, Cl. 123-32.0EE.
Stumpp, Gerhard, 4,187,813, Cl. 123-136.000.
Robertson, George H.; Boyd, Alistair B.; and Rooney, Robert L., to Ciba-Geigy Corporation. Process for the production of a pigment composition. 4,188,236, Cl. 106-308.00Q.
Robinson, John W.; and Howell, Stephen L., to Kimball International, Inc. Automatic arpeggiator. 4,187,756, Cl. 84-1.240.
Robinson, Leon: *See*—
Longanbach, James R.; and Robinson, Leon, 4,188,191, Cl. 44-1.00F.
Robinson, Neil L.: *See*—
Cheatham, Samuel D.; Robinson, Neil L.; and Smathers, Edmond W., 4,188,649, Cl. 360-118.000.
Rock, John A.: *See*—
Fox, Daniel W.; and Rock, John A., 4,188,314, Cl. 260-37.0PC.
Rockwell International Corporation: *See*—
Bongianni, Wayne L., 4,188,594, Cl. 332-16.00R.
Flanagan, Joseph E.; and Lo, George A., 4,187,781, Cl. 102-38.0CC.
Massie, Norbert A.; and Holly, Sandor, 4,188,122, Cl. 356-349.000.
Perkins, William C., 4,188,619, Cl. 340-310.00R.
Rockwell-Rimoldi, S.p.A.: *See*—
Fietta, Emilio; and Della Torre, Giancarlo, 4,187,793, Cl. 112-288.000.
Roder, Albert: *See*—
Schneider, Walter; Roder, Albert; Mollering, Hans; and Gutmann, Ingeborg, 4,188,465, Cl. 435-12.000.
Roecar Holdings (Netherlands Antilles) N.V.: *See*—
Pegel, Karl H., 4,188,379, Cl. 424-182.000.
Roesch, Alfred: *See*—
Chang, Mike F.; Roesch, Alfred; and Kennedy, Richard W., 4,188,245, Cl. 148-188.000.
Rogers, Herbert I.; Chappelle, Michael C.; Brindle, Robert G.; and Brindle, Patrick A. Telephone call restricting apparatus. 4,188,508, Cl. 179-18.0DA.
Rogers, Morris A.: *See*—
Rispoli, Joseph M.; Rogers, Morris A.; Sims, Rex J.; and Waitman, Reuben H., Sr., 4,188,410, Cl. 426-296.000.
Rogers, Walter C., Jr.; and Hoffman, David S., to Royal Development Company, Inc. Handle-operated wall-avoiding recliner chair with headrest. 4,188,062, Cl. 297-61.000.
Rohco, Inc.: *See*—
Eckles, William E.; Ferguson, Wilfred J.; and Willis, William J., 4,188,271, Cl. 204-55.00R.
Rohm GmbH: *See*—
Hanstein, Friedrich; Moench, Theodor P.; and Schreyer, Gunter, 4,188,425, Cl. 428-34.000.
Rohowetz, Stanley E., to American Can Company. Thermotropic adhesive tape. 4,188,437, Cl. 428-199.000.
Rolls-Royce Limited: *See*—
Richardson, John P., 4,187,674, Cl. 60-39.360.
Romano, Bruno: *See*—
Castelli, Pier P.; and Romano, Bruno, 4,188,322, Cl. 260-239.55R.
Rook, Charles W.: *See*—
Brown, Kenneth H.; Carr, Michael E.; and Rook, Charles W., 4,188,589, Cl. 331-12.000.
Rooney, Robert L.: *See*—
Robertson, George H.; Boyd, Alistair B.; and Rooney, Robert L., 4,188,236, Cl. 106-308.00Q.
Rosati, Francesco: *See*—
Collina, Amilcare; Soverini, Arrigo; and Rosati, Francesco, 4,188,470, Cl. 526-64.000.
Ross, Gerald F.: *See*—
Cronson, Harry M.; Rao, Basrur R.; and Ross, Gerald F., 4,188,595, Cl. 333-113.000.
Ross, Roger J.; and Tullman, Edward J., to Singer Company, The. Sewing machine work feeding mechanism. 4,187,794, Cl. 112-308.000.
Rossi, Alberto: *See*—
Haas, Georges; Rossi, Alberto; Ferrini, Pier G.; and Schier, Oswald, 4,188,396, Cl. 424-267.000.
Rothgordt, Ulf: *See*—
Schayes, Raymond G.; Homan, Pieter; and Rothgordt, Ulf, 4,188,643, Cl. 358-280.000.
Rouaud, Christian: *See*—
Abbes, Claude; Gournier, Andre; Rouaud, Christian; and de Villepoix, Raymond, 4,188,037, Cl. 277-2.000.
Rowden, George A., to Davy International (Oil and Chemicals) Limited. Recovery of uranium values. 4,188,361, Cl. 423-9.000.
Rowlandson, Gordon; Reeve, Douglas W.; and Rapson, W. Howard, to Erco Envirotech Ltd. Low effluent pulp mill, bleach plant operation. 4,188,260, Cl. 162-16.000.
Rowley, James R.: *See*—
Brown, William J.; and Rowley, James R., 4,188,168, Cl. 414-786.000.
Rowney, John E.: *See*—
Mamers, Heikki; and Rowney, John E., 4,188,259, Cl. 162-4.000.
Royal Development Company, Inc.: *See*—
Rogers, Walter C., Jr.; and Hoffman, David S., 4,188,062, Cl. 297-61.000.
Rozanski, Walter J., Jr.: *See*—
Cannalte, Gary A.; Chapman, Ronald H.; and Rozanski, Walter J., Jr., 4,188,582, Cl. 325-58.000.
Rudolphi, Kjell, to AGA Aktiebolag. Method and device for cleaning a sloping or vertical surface on an optical element. 4,187,868, Cl. 134-184.000.
Russell, Kenneth J.: *See*—
Harp, Robert S.; and Russell, Kenneth J., 4,188,590, Cl. 331-56.000.
Ruti-te Strake B.V.: *See*—
van Mullekom, Hubert P., 4,187,888, Cl. 139-435.000.
Rycheck, Mark R.; and Pennella, Filippo, to Phillips Petroleum Company. Purification of monoolefin-containing hydrocarbon stream. 4,188,501, Cl. 585-643.000.
Rydstrom, Hans F. Remote controlled image display device. 4,187,632, Cl. 40-446.000.
Ryobi, Ltd.: *See*—
Nagai, Kazumasa, 4,188,026, Cl. 271-148.000.
S.A.T.E.M. St d Application des Techniques Electriques et Mecaniques: *See*—
Pujol, Yves A., 4,188,053, Cl. 289-18.100.
S & F Associates: *See*—
Smith, James E., 4,187,721, Cl. 73-194.00B.
Sada, Hidetaka: *See*—
Abiru, Hisanori; Nakao, Yoshiaki; Imamura, Yoshiaki; and Sada, Hidetaka, 4,187,614, Cl. 33-174.00L.
Sadler, Loren G.: *See*—
Brackbill, Warren H.; and Sadler, Loren G., 4,187,988, Cl. 239-662.000.
Sakai, Akira: *See*—
Tsuji, Kunio; Hisano, Katsukuni; Sakai, Akira; and Nakamura, Shozo, 4,187,685, Cl. 60-660.000.
Sakoda, Ryozo; Hashiba, Isao; and Nagano, Kazuo, to Nissan Chemical Industries, Ltd. Process for preparing anthranylaldehyde derivatives. 4,188,343, Cl. 260-571.000.
Sakurai, Yoshitoshi, to Honda Giken Kogyo Kabushiki Kaisha. Exhaust port liner support for internal combustion engine. 4,187,677, Cl. 60-282.000.
Sam, Ronald: *See*—
Gensike, Karl H.; and Sam, Ronald, 4,188,114, Cl. 355-54.000.
Samanta, Mrinmay: *See*—
Macedo, Pedro B.; Simmons, Joseph H.; and Samanta, Mrinmay, 4,188,198, Cl. 65-3.00A.
Sampson, Jacob. Bundle tying machine. 4,187,773, Cl. 100-4.000.

Samuels, Peter B.; and Wood, Ernest C. Hemostatic clip applicator. 4,187,712, Cl. 72-410.000.

SANAC Societa per Azioni Refrattari Argille e Calolini: *See*—
Aliprandi, Giovanni; Ricci, Roberto; and Timossi, Giovanni, 4,187,965, Cl. 222-600.000.

Sandoz Ltd.: *See*—
Mislin, Roland; and Steiner, Karl-Ulrich, 4,188,187, Cl. 8-39.00B.
Neumann, Peter, 4,188,393, Cl. 424-258.000.

Sanford, George A. Oil well pump drive. 4,187,680, Cl. 60-369.000.

Sangalli, Sylvio: *See*—
Braconnier, Daniel; Guillermin, Rene; and Sangalli, Sylvio, 4,188,429, Cl. 428-85.000.

Sano, Takezo; and Sasaki, Masao, to Sumitomo Chemical Company, Limited. Process for preparing novel thin films. 4,188,273, Cl. 204-158.0HE.

Sanson, Henry E., III; and Hartman, Wallace R., Jr., to Mayco Oil and Chemical Company, Inc. Cosulfurized olefin and lard oil. 4,188,300, Cl. 252-48.600.

Sargent, Raymond W.: *See*—
Reich, Zygmund; and Sargent, Raymond W., 4,188,654, Cl. 362-32.000.

Sarkisian, Levon A.; Matsoian, Stepan G.; Gabzimalian, Vagram G.; Mailian, Shaen M.; Galstian, Albert P.; Azarian, Vazgen K.; Ter-Davtian, Zorik S.; Gevorkian, Raya G.; Gevorkian, Ogden A.; Khudoian, Korjun L.; Ovsepian, Lavrenty A.; Arutjunova, Amalia A.; and Mkrtchian, Foerbakh V., to Institut Organicheskoi Khimii Akademii Nauk Armyanskoi. Polymeric binder for chewing gum, method for preparing same and chewing gum based on said polymeric binder. 4,188,406, Cl. 426-3.000.

Saruwatari, Teturo; and Mukai, Yositaka. Method and apparatus for automatically assembling spoked wheels. 4,187,895, Cl. 157-1.550.

Sasaki, Masao: *See*—
Sano, Takezo; and Sasaki, Masao, 4,188,273, Cl. 204-158.0HE.

Sasaki, Yasushi: *See*—
Naruse, Tunehide; Sasaki, Yasushi; and Matsumoto, Yukio, 4,188,301, Cl. 252-62.540.

Sato, Eiichi: *See*—
Nakatsubo, Toshio; Nishikawa, Masaji; and Sato, Eiichi, 4,187,800, Cl. 118-724.000.

Sato, Masaaki: *See*—
Kasuga, Masao; Takahashi, Nobuaki; Sato, Masaaki; Seki, Kohji; Mori, Toshinori; and Iwahara, Makoto, 4,188,504, Cl. 179-1.0GP.

Sato, Masamichi; Ikeda, Sadaharu; and Ikeda, Tomoaki, to Fuji Photo Film Co., Ltd. Photosensitive printing plate, method of preparing same, and method of processing same. 4,188,215, Cl. 430-156.000.

Sato, Shigeru, to Tokyo Shibaura Electric Co., Ltd. Ultrasonic wave diagnostic apparatus to concurrently display an echo signal and a reference signal. 4,187,857, Cl. 128-660.000.

Sato, Susumu; and Shiba, Hiroshi, to Nippon Electric Co., Ltd. Semiconductor device having bump terminal electrodes. 4,188,636, Cl. 357-71.000.

Savage, Harry A. System for utilizing solar energy and ambient air in air conditioners during the heating mode. 4,187,687, Cl. 62-2.000.

Savich, Peter P., to Smyth Manufacturing Company, The. Method for making integrated book lining. 4,187,572, Cl. 11-2.000.

Savitsky, Alexandr V.: *See*—
Gavrev, Valery S.; Goncharuk, Jury M.; Birjukov, Sergei B.; Savitsky, Alexandr V.; and Popova, Ljudmila A., 4,187,725, Cl. 73-613.000.

Sawada, Shuichi, to Nippon Gakki Seizo Kabushiki Kaisha. Process for producing shaped articles with patterns. 4,188,316, Cl. 260-40.00R.

Sawada, Takashi: *See*—
Mizutani, Nagao; Sawada, Takashi; Okawara, Yasuo; Koizumi, Michio; and Kurihara, Toshio, 4,188,135, Cl. 400-214.000.

SCA Development Aktiebolag: *See*—
Backlund, Sture O. E., 4,188,261, Cl. 162-42.000.

Scales, Stanley R., to Hughes Tool Company. Combination carburizing and boronizing methods. 4,188,242, Cl. 148-15.500.

Schabel, Karl-Heinz: *See*—
Casper, Rudolf; Grober, Roland; Schabel, Karl-Heinz; and Siemer, Klaus, 4,188,196, Cl. 55-270.000.

Schaefer, Klaus-Dieter, to Ernst Leitz Wetzlar GmbH. Mirror reflex camera with electronic rangefinder. 4,188,102, Cl. 354-25.000.

Schafer, Hermann: *See*—
Weber, Gerd; Skoupi, Dieter; and Schafer, Hermann, 4,188,356, Cl. 264-40.100.

Schayes, Raymond G.; Homan, Pieter; and Rothgordt, Ulf, to U.S. Philips Corporation. Method and arrangement for correcting errors in facsimile transmission. 4,188,643, Cl. 358-280.000.

Scheben, John A.: *See*—
Hinnenkamp, James A.; and Scheben, John A., 4,188,490, Cl. 560-245.000.

Schenck, Karl-Wilhelm; Nissel, Gunthard; and Schuster, Erich, to Ernst Leitz Wetzlar GmbH. Two-coordinate length measuring device for microscopic instruments. 4,188,119, Cl. 356-252.000.

Scherr, Norman J., Jr.: *See*—
Smith, David L.; and Scherr, Norman J., Jr., 4,187,646, Cl. 51-165.770.

Scheumann, Leonhard: *See*—
Wierzchowski, Dieter; Fischer, Klaus; Formanek, Gunther; and Scheumann, Leonhard, 4,188,528, Cl. 219-490.000.

Schier, Oswald: *See*—
Haas, Georges; Rossi, Alberto; Ferrini, Pier G.; and Schier, Oswald, 4,188,396, Cl. 424-267.000.

Schirmer, Henry G.: *See*—
Mueller, Walter B.; Schirmer, Henry G.; Schoenberg, Julian H.; and Weinberg, Alan S., 4,188,443, Cl. 428-216.000.

Schischkoff, Kurt: *See*—
Ito, Kenichiro; and Schischkoff, Kurt, 4,187,750, Cl. 83-67.000.

Schisselbauer, John C.; Garczynski, John S.; Auchinleck, Richard J.; and LoFurno, Henry J., to Peripheral Dynamics, Inc. Badge reader with reliable data clocking means. 4,187,980, Cl. 235-474.000.

Schlossmann, Klaus: *See*—
Bossert, Friedrich; Wehinger, Egbert; Meyer, Horst; Heise, Arend; Kazda, Stanislav; Stoepel, Kurt; Towart, Robertson; Vater, Wulf; and Schlossmann, Klaus, 4,188,395, Cl. 424-266.000.

Schmid, Frederick, to Crystal Systems, Inc. Cutting. 4,187,828, Cl. 125-18.000.

Schmid, Pierre; Brunner, Eduard; and Stofer, Walter, to Gretag Aktiengesellschaft. Method and installation for masked speech transmission over a telephone channel. 4,188,506, Cl. 179-1.50R.

Schmidhammer, Ludwig; and Frey, Hellmuth, to Wacker-Chemie GmbH. Process for treating unreacted 1,2-dichloroethane from 1,2-dichloroethane cracking. 4,188,347, Cl. 260-652.00P.

Schneider, Walter; Roder, Albert; Mollering, Hans; and Gutmann, Ingeborg, to Boehringer Mannheim GmbH. Stabilized urease composition. 4,188,465, Cl. 435-12.000.

Schnitzer, Emanuel: *See*—
Fisher, Edmund A.; and Schnitzer, Emanuel, 4,188,156, Cl. 405-195.000.

Schnoes, Heinrich K.: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; Napoli, Joseph L., Jr.; and Onisko, Bruce L., 4,188,345, Cl. 568-665.000.

Schnurle, Hans; Mayer, Rudi; and Kraus, Bernd, to Robert Bosch GmbH. Fuel-air mixture control apparatus. 4,187,806, Cl. 123-32.0EE.

Schoberl, M.: *See*—
Reis, A.; Kirmaier, N.; and Schoberl, M., 4,188,278, Cl. 204-268.000.

Schochat, Nathaniel E.; and Martin, Fred L. Electronic CB twenty meter. 4,188,529, Cl. 235-92.0DN.

Schoenberg, Julian H.: *See*—
Mueller, Walter B.; Schirmer, Henry G.; Schoenberg, Julian H.; and Weinberg, Alan S., 4,188,443, Cl. 428-216.000.

Schrawer, Rolf; Diehl, Werner K.; and Ringelstein, Hans M., to Messer Griesheim GmbH. Safety insert for storage vessels of low-boiling liquified gases. 4,187,956, Cl. 220-465.000.

Schreder, Rene: *See*—
Moreau, Claude; and Schreder, Rene, 4,188,166, Cl. 414-735.000.

Schreiber, Peter J., to N.A.D., Inc. Pressure monitor for breathing system. 4,187,842, Cl. 128-202.220.

Schreyer, Gunter: *See*—
Hanstein, Friedrich; Moench, Theodor P.; and Schreyer, Gunter, 4,188,425, Cl. 428-34.000.

Schroder, Karl: *See*—
Kuipers, Arie; and Schroder, Karl, 4,188,411, Cl. 426-582.000.

Schroder, Rolf, to Wagener & Co. Belt press. 4,187,776, Cl. 100-93.00P.

Schumacher, Ernest W., to Virginia Chemicals Inc. Air-conditioning system having recirculating and flow-control means. 4,187,695, Cl. 62-503.000.

Schupp, Eberhard: *See*—
Kempter, Fritz E.; Schupp, Eberhard; and Blum, Rainer, 4,188,312, Cl. 260-19.0EP.

Schuster, Erich: *See*—
Schenck, Karl-Wilhelm; Nissel, Gunthard; and Schuster, Erich, 4,188,119, Cl. 356-252.000.

Schwab, Kurt, to D. Swarovski & Co, Glasschleiferei. Apparatus for manufacturing identification plates having indented retroreflective characters. 4,188,256, Cl. 156-386.000.

Schwartz, Martin L.: *See*—
Zinnes, Harold; and Schwartz, Martin L., 4,188,482, Cl. 544-32.000.

Schwartz, Robert E.: *See*—
Zink, John S.; Reed, Robert D.; and Schwartz, Robert E., 4,188,183, Cl. 431-202.000.

Schwarz, Gunter, to S.A. Etablissement Francois Salomon & Fils. Ski brake apparatus. 4,188,043, Cl. 280-605.000.

Sciavolino, Frank C., to Pfizer Inc. Semi-synthetic oleandomycin derivatives-C_8 modifications. 4,188,479, Cl. 536-9.000.

SCM Corporation: *See*—
Dannatt, Hugh St. L., 4,188,137, Cl. 400-496.000.

Scolastico, Carlo; and Tronconi, Giovanni, to L'Instituto Farmaceutico S.p.A. (2-Pyrimidinyl-thio)-alkanoic acid amides and their preparation. 4,188,484, Cl. 544-317.000.

Sconzo, Thomas. Window and door frame assembly adapted to facilitate installation and removal of window panes. 4,187,643, Cl. 49-455.000.

Scott, Ian M., to Brown & Sharpe Manufacturing Company. Height gage. 4,187,612, Cl. 33-172.00E.

Seal Incorporated: *See*—
Hemperly, Lyle D., Jr., 4,188,254, Cl. 156-382.000.

SECIM: *See*—
Quehen, Andre, 4,187,707, Cl. 72-8.000.

Sedykh, Aelita S.: *See*—
Melnikov, Nikolai N.; Grapov, Artur F.; Razvodovskaya, Ljudmila V.; Popov, Petr V.; Sedykh, Aelita S.; Shapovalova, Galina K.; Abelentseva, Galina M.; Siforova, Tamara A.; Nikolaeva, Tatyana A.; Galitsina, Valentina V.; Stonov, Leonid D.; and Bakumenko, Ljudmila A., 4,188,382, Cl. 424-200.000.

Seger, Edward J.; and Haupin, Warren E., to Aluminum Company of America. Method and apparatus for measuring the integrity of an electrolytic cell lining. 4,188,267, Cl. 204-1.00T.

Seikagaku Kogyo Co. Ltd.: *See—*
Iwanaga, Sadaaki; Morita, Takashi; Nakamura, Shin; Takahashi, Kenji; and Niwa, Makoto, 4,188,264, Cl. 23-230.00B.

Seipp, William H.: *See—*
Fauchier, Jess F.; Seipp, William H.; and Whiteside, Stephen E., 4,188,617, Cl. 340-183.000.

Sejpal, Vasant D., to American Home Products Corporation. Non-foaming, clear, aerosol vegetable oil compositions containing lecithin, ethyl alcohol and hydrocarbon propellents. 4,188,412, Cl. 426-609.000.

Seki, Kohji: *See—*
Kasuga, Masao; Takahashi, Nobuaki; Sato, Masaaki; Seki, Kohji; Mori, Toshinori; and Iwahara, Makoto, 4,188,504, Cl. 179-1.0GP.

Seki, Shigeo: *See—*
Nakamura, Takeshi; Nakabayashi, Satoru; Fukatsu, Shunzo; and Seki, Shigeo, 4,188,480, Cl. 536-17.000.

Sekiya, Setsuro: *See—*
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, 4,187,816, Cl. 123-139.0AW.

Selcukoglu, Yuksel A.; Husain, Matloob; and Hanke, Carl C., Jr., to Chicago Bridge & Iron Company. Apparatus for reliquefying boil-off natural gas from a storage tank. 4,187,689, Cl. 62-54.000.

Selner, Allen J. Biomechanical shoe. 4,187,620, Cl. 36-28.000.

Selvin, Gerald J.; Oliver, Leland W.; Yamamoto, Stephen K.; and Hogan, Clarence V., to International Telephone and Telegraph Corporation. Method of making electrical connector assembly. 4,187,605, Cl. 29-629.000.

Selwood, Alan: *See—*
Ellis, Peter M.; and Selwood, Alan, 4,188,436, Cl. 428-198.000.

Semjonow, Valentin, to Hoechst Aktiengesellschaft. Process for the manufacture of non-woven structures. 4,187,586, Cl. 19-161.100.

Semke, Victor. Flushing device. 4,187,563, Cl. 4-256.000.

Senften, John W., to Harvey Hubbell, Incorporated. Section insulator for catenary systems. 4,187,934, Cl. 191-39.000.

Sensi, Piero: *See—*
Maggi, Nicola; and Sensi, Piero, 4,188,321, Cl. 260-239.30P.

Seragnoli, Enzo, to G. D. Societa per Azioni. Device for folding sheet material into hinged lid packets. 4,188,024, Cl. 270-67.000.

Shah, Jagdish K.: *See—*
Yeates, Richard; Terlecky, Boris S.; and Shah, Jagdish K., 4,187,600, Cl. 29-564.000.

Shajenko, Peter, to United States of America, Navy. Acousto-optical transducer. 4,188,096, Cl. 350-358.000.

Shanbrom, Edward. Simplified method for preparation of high yield, high purity Factor VIII concentrate. 4,188,318, Cl. 260-112.00B.

Shapovalova, Galina K.: *See—*
Melnikov, Nikolai N.; Grapov, Artur F.; Razvodovskaya, Ljudmila V.; Popov, Petr V.; Sedykh, Aelita S.; Shapovalova, Galina K.; Abelentseva, Galina M.; Siforova, Tamara A.; Nikolaeva, Tatyana A.; Galitsina, Valentina V.; Stonov, Leonid D.; and Bakumenko, Ljudmila A., 4,188,382, Cl. 424-200.000.

Sharp Kabushiki Kaisha: *See—*
Matsui, Hirotoshi, 4,188,133, Cl. 400-121.000.
Mizukami, Etsuo; Kishishita, Hiroshi; Kawaguchi, Masashi; Endo, Yoshihiro; and Isaka, Kinichi, 4,188,565, Cl. 313-509.000.

Shehi, Lyle E. Automobile trunk lid holder. 4,188,061, Cl. 296-76.000.

Shell Oil Company: *See—*
Bull, Michael J., 4,188,400, Cl. 424-285.000.
Holden, Geoffrey; and Gouw, Lam H., 4,188,432, Cl. 428-35.000.
Huizer, Leendert; Van Namen, Dirk J.; and Oranje, Pieter J. D., 4,188,497, Cl. 568-799.000.

Shemer, Michael, to Miles Laboratories, Inc. Process for preparing a heat coagulable viscous protein. 4,188,399, Cl. 426-276.000.

Shen, Jan-son, to Boeing Company, The. Constant pressure hydraulic accumulator. 4,187,682, Cl. 60-413.000.

Shepherd, Charles J., to W. J. Bradford Paper Company. Combination slotted partition spacer. 4,187,975, Cl. 229-15.000.

Sherman, Charles J., to Western Electric Company, Inc. Fluid bearing. 4,187,867, Cl. 134-64.00P.

Sherrin, Thomas P.: *See—*
Stach, Paul E.; and Sherrin, Thomas P., 4,187,890, Cl. 141-27.000.

Shiba, Haruo: *See—*
Okamura, Masatoshi; and Shiba, Haruo, 4,187,998, Cl. 242-199.000.

Shiba, Hiroshi: *See—*
Sato, Susumu; and Shiba, Hiroshi, 4,188,636, Cl. 357-71.000.

Shibasaki, Kyuichi, to Toyo Seikan Kaisha, Ltd. Method and apparatus for inspecting an internal pressure of hermetically sealed container. 4,187,718, Cl. 73-52.000.

Shibata, Tsugio. Power wrench having ratchet means at both surfaces of socket thereof. 4,187,746, Cl. 81-57.390.

Shibatani, Juichi: *See—*
Ishikawa, Masakazu; Shibatani, Juichi; and Ito, Sadayoshi, 4,188,073, Cl. 303-87.000.

Shimizu, Kazuaki: *See—*
Yama, Toshio; and Shimizu, Kazuaki, 4,188,074, Cl. 303-92.000.

Shipper, Harmon E.: *See—*
Freeman, Murray E.; and Shipper, Harmon E., 4,187,872, Cl. 137-454.600.

Shirai, Kazuya. Apparatus for cutting sheet glass. 4,187,755, Cl. 83-882.000.

Shore, Ronald H. Self-inflating solar curtain. 4,187,896, Cl. 160-121.00R.

Shrive, Nigel G.: *See—*
Gillott, Jack E.; Jordaan, Ian J.; Loov, Robert E.; and Shrive, Nigel G., 4,188,230, Cl. 106-70.000.

Shroyer, Cecil E. Relay repair apparatus. 4,188,602, Cl. 335-132.000.

Shultz, David E.: *See—*
Wilson, Harry L.; Shultz, David E.; and Muntean, George L., 4,187,817, Cl. 123-139.0AW.

Sibbett, Donald J.: *See—*
Allen, Richard T.; Moyer, Rudolph H.; Sibbett, Donald J.; Anderson, Howard H.; Martner, Glen R.; and Willis, Don, 4,187,836, Cl. 128-2.080.
Allen, Richard T.; Moyer, Rudolph H.; Sibbett, Donald J.; Anderson, Howard H.; Martner, Glen R.; and Willis, Don, 4,187,859, Cl. 128-725.000.

Siegel, Walter P.: *See—*
Boser, Ronald J.; Siegel, Walter P.; and Picciotti, Michael F., 4,187,792, Cl. 112-286.000.

Siegman, Anthony E.; Holmes, Neil C.; and Artusy, Max T., to United States of America, Air Force. RF excited mercury laser lamp. 4,188,591, Cl. 331-94.50P.

Siemens Aktiengesellschaft: *See—*
Franke, Kurt, 4,188,537, Cl. 250-416.0TV.
Knauer, Karl, 4,188,597, Cl. 333-165.000.
Mattuschka, Werner, 4,188,557, Cl. 310-368.000.
Streble, Bernd, 4,188,080, Cl. 339-14.00R.

Siemer, Klaus: *See—*
Casper, Rudolf; Grober, Roland; Schabel, Karl-Heinz; and Siemer, Klaus, 4,188,196, Cl. 55-270.000.

Siforova, Tamara A.: *See—*
Melnikov, Nikolai N.; Grapov, Artur F.; Razvodovskaya, Ljudmila V.; Popov, Petr V.; Sedykh, Aelita S.; Shapovalova, Galina K.; Abelentseva, Galina M.; Siforova, Tamara A.; Nikolaeva, Tatyana A.; Galitsina, Valentina V.; Stonov, Leonid D.; and Bakumenko, Ljudmila A., 4,188,382, Cl. 424-200.000.

Sih, John C., to Upjohn Company, The. Pyran analogs of 2,3,4,5-tetradehydro-PGI$_1$ compounds. 4,188,481, Cl. 542-426.000.

Silvestri, Giovanni J. Epicyclic gear train planet carrier system. 4,187,740, Cl. 74-750.00R.

Silvestrini, Richard L.; and Newton, Paul P., to Warner Electric Brake & Clutch Company. Armature assembly for electromagnetic coupling. 4,187,939, Cl. 192-84.00C.

Simco Company, Inc., The: *See—*
Miller, Bruce H., 4,188,530, Cl. 250-324.000.

Simmonds Precision Products, Inc.: *See—*
Reich, Zygmund; and Sargent, Raymond W., 4,188,654, Cl. 362-32.000.

Simmons, Frederick A., to Phillips Screw Company. Recessed screw heads and drivers. 4,187,892, Cl. 145-50.00A.

Simmons, Joseph H.: *See—*
Macedo, Pedro B.; Simmons, Joseph H.; and Samanta, Mrinmay, 4,188,198, Cl. 65-3.00A.

Simon Container Machinery Limited: *See—*
Bullock, Allen R., 4,187,769, Cl. 93-52.000.

Simpson, Robert. Condenser leak searching plugs. 4,187,716, Cl. 73-40.000.

Sims, Rex J.: *See—*
Risnoli, Joseph M.; Rogers, Morris A.; Sims, Rex J.; and Waitman, Reuben H., Sr., 4,188,410, Cl. 426-296.000.

Simuro, Ernest G.; Turk, Abraham A.; and Turk, Nathan M. Horseman's pocket knife. 4,187,607, Cl. 30-152.000.

Sinclair, Norman: *See—*
Zwiren, Jan M.; Casper, Selma M.; and Sinclair, Norman, 4,187,866, Cl. 132-151.000.

Sinclair, William Y., to Aries Electronics, Inc. Flexible electrical jumper and method of making same. 4,187,606, Cl. 29-629.000.

Singer Company, The: *See—*
Ross, Roger J.; and Tullman, Edward J., 4,187,794, Cl. 112-308.000.
Vogel, John D., 4,187,790, Cl. 112-158.00E.

Sinko, Michael J.; and Velinsky, Milton, to Echlin Manufacturing Company, The. Coded module for use in a magnetic pulse generator and method of manufacture. 4,187,981, Cl. 235-488.000.

Sitnov, Anatoly G.: *See—*
Manokhin, Anatoly I.; Sitnov, Anatoly G.; Genkin, Vitaly Y.; and Liberman, Anatoly L., 4,187,898, Cl. 164-421.000.

Sitrl, Erhard: *See—*
Regler, Dieter; Sitrl, Erhard; and Moritz, Alfred, 4,187,827, Cl. 125-16.00R.

Skodack, Gary J.: *See—*
Rajput, Yudh V.; and Skodack, Gary J., 4,188,075, Cl. 303-106.000.

Skoupi, Dieter: *See—*
Weber, Gerd; Skoupi, Dieter; and Schafer, Hermann, 4,188,356, Cl. 264-40.100.

Smathers, Edmond W.: *See—*
Cheatham, Samuel D.; Robinson, Neil L.; and Smathers, Edmond W., 4,188,649, Cl. 360-118.000.

Smith, Charles R., to Eaton Corporation. Thermally responsive power elements with multiple vapor/gas filled capsules and hydraulic fluid transmissions. 4,187,684, Cl. 60-531.000.

Smith, David L.; and Scherr, Norman J., Jr., to Valeron Corporation, The. Apparatus for grinding. 4,187,646, Cl. 51-165.770.

Smith, David W.: *See—*
Townsend, Ray T.; and Smith, David W., 4,187,583, Cl. 17-49.000.

Smith, Franklin G.: *See—*
Harris, Richard D.; Smith, Franklin G.; and Moshofsky, Jerome F., 4,187,590, Cl. 24-73.00P.

Smith, Fred J.: *See—*
Bower, David S.; and Smith, Fred J., 4,188,510, Cl. 179-90.0BD.
Smith International, Inc.: *See—*
Garner, Lloyd L., 4,187,921, Cl. 175-340.000.
Thomas, Robert D., 4,187,743, Cl. 76-108.00A.
Smith, James E., to S & F Associates. Method and structure for flow measurement. 4,187,721, Cl. 73-194.00B.
Smith, Maurice I.; Gillen, John D.; and Edwards, Gerald L., to Tone Commander Systems, Inc. Multi-link telephone intercom system. 4,188,511, Cl. 179-99.00A.
Smith, Oliver W.; Koleske, Joseph V.; and Knopf, Robert J., to Union Carbide Corporation. Isocyanate derivatives of ester diol alkoxylates and compositions thereof. 4,188,477, Cl. 528-288.000.
Smith, Trevor S., to Lucas Industries Limited. Fuel control system for a gas turbine engine. 4,187,673, Cl. 60-39.28R.
SmithKline Corporation: *See—*
Hill, David T., 4,188,397, Cl. 424-273.00R.
Smolinski, Ronald E. Closed chamber rotary vane gas cycle cooling system. 4,187,693, Cl. 62-402.000.
Smolko, Gennady G. Electronic device. 4,188,652, Cl. 361-402.000.
Smyth Manufacturing Company, The: *See—*
Savich, Peter P., 4,187,572, Cl. 11-2.000.
Societa Italiana Telecomunicazioni Siemens S.p.A.: *See—*
Cavalieri D'Oro, Enzo, 4,188,600, Cl. 333-228.000.
Papa, Franco, 4,188,599, Cl. 333-219.000.
Societe Anonyme Automobiles Citroen: *See—*
Audoux, Guy, 4,187,808, Cl. 123-48.0AA.
S.A. des Etablissements Staubli: *See—*
Palau, Joseph, 4,187,886, Cl. 139-68.000.
S.A. Etablissement Francois Salomon & Fils: *See—*
Schwarz, Gunter, 4,188,043, Cl. 280-605.000.
Societe de Paris et du Rhone: *See—*
Mazzorana, Alfred, 4,187,728, Cl. 74-6.000.
Societe de Prayon: *See—*
Houghtaling, Samuel V., 4,188,366, Cl. 423-320.000.
Societe Nationale Industrielle et Aerospatiale: *See—*
Legrand, Francis; and Weisser, Bernard, 4,188,666, Cl. 364-434.000.
Soderberg, Mark S., to Boeing Company, The. Motor quick-change chuck system for tool having cylindrically shaped adapter portion. 4,188,041, Cl. 279-75.000.
Soderberg, Mark S.: *See—*
Hametner, Albert L.; and Soderberg, Mark S., 4,187,889, Cl. 140-92.100.
Sokol, Phillip E.; and Farmer, Robert F., to Gillette Company, The. Latent image printing and development. 4,188,431, Cl. 428-29.000.
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Bobrovnikov, Anatoly P.; Zakharov, Alexandr V.; Soloviev, Gennady I.; Mikhailov, Gennady G.; Golubeva, Tamara N.; and Glushkova, Nina N., 4,187,652, Cl. 52-90.000.
Sony Corporation: *See—*
Kazami, Shin-Ichi; and Doi, Toshitada, 4,188,616, Cl. 340-146.1AL.
Yoshio, Akira, 4,188,240, Cl. 148-6.14R.
Zandelin, Ernst E., 4,187,631, Cl. 40-381.000.
Sordello, Frank J.; Darrah, Edward R.; and Touchton, James J., to Sperry Rand Corporation. Sectorized data path following servo system. 4,188,646, Cl. 360-77.000.
Soverini, Arrigo: *See—*
Collina, Amilcare; Soverini, Arrigo; and Rosati, Francesco, 4,188,470, Cl. 526-64.000.
Spector, George: *See—*
Fernandez, Arthur A.; and Spector, George, 4,187,784, Cl. 104-235.000.
Spehrley, Charles W., Jr., to Xerox Corporation. Fixed stapler head. 4,187,969, Cl. 227-2.000.
Sperry Corporation: *See—*
Cronson, Harry M.; Rao, Basrur R.; and Ross, Gerald F., 4,188,595, Cl. 333-113.000.
Sperry Rand Corporation: *See—*
Brackbill, Warren H.; and Sadler, Loren G., 4,187,988, Cl. 239-662.000.
Martin, E. Joel, 4,187,941, Cl. 193-5.000.
Mast, Aquila D., 4,187,667, Cl. 56-341.000.
McIlwain, Irwin D., 4,187,666, Cl. 56-341.000.
Meek, Nigel W.; and Ramsay, Jeffrey S., 4,187,664, Cl. 56-13.600.
Sordello, Frank J.; Darrah, Edward R.; and Touchton, James J., 4,188,646, Cl. 360-77.000.
Sprague Electric Company: *See—*
Dornfeld, John E.; and Joyner, Bobby L., 4,188,651, Cl. 361-322.000.
Sprengers, Johannes: *See—*
Withoos, Wilhelmus H. C.; te Raa, Gerhardus A.; and Sprengers, Johannes, 4,188,358, Cl. 264-255.000.
Sprenkle, George J.: *See—*
Aldridge, Lionel D.; and Sprenkle, George J., 4,188,085, Cl. 339-176.0MP.
Sroka, Edward A. Highway lane marker. 4,188,150, Cl. 404-11.000.
Stach, Paul E.; and Sherrin, Thomas P., to Mono-Med, Inc. Filling apparatus for pharmaceuticals. 4,187,890, Cl. 141-27.000.
Stal-Laval Turbin AB: *See—*
Hugosson, Evald; and Kullendorf, Anders, 4,188,458, Cl. 428-556.000.
Standard Oil Company: *See—*
Fitzgibbons, William O., 4,188,292, Cl. 210-29.000.
Standard Oil Company (Indiana): *See—*
Caspari, Gunter, 4,188,299, Cl. 252-46.400.
Fields, Ellis K., 4,188,274, Cl. 204-158.0HA.
Fields, Ellis K., 4,188,275, Cl. 204-158.00R.
Froning, H. Robert; Owens, William W.; and Archer, Duane L., 4,187,907, Cl. 166-275.000.
Quick, Leonard M.; and Hensley, Albert L., Jr., 4,188,284, Cl. 208-216.0PP.
Swartz, Henry D., 4,188,253, Cl. 156-361.000.
Stange, Klaus K., to Xerox Corporation. Photoconductive belt supporting apparatus. 4,188,110, Cl. 355-3.0BE.
Staub, Martin L.: *See—*
Gusfafson, Gary B.; and Staub, Martin L., 4,188,025, Cl. 271-314.000.
Stauble, Georg: *See—*
Hintner, Josef; and Stauble, Georg, 4,188,072, Cl. 303-69.000.
Steck, Werner: *See—*
Becker, Hans-Juergen; Jaeckh, Christof; Koester, Eberhard; Loeser, Werner; Ohlinger, Manfred; and Steck, Werner, 4,188,302, Cl. 252-62.560.
Stecklein, Gary L., to Deere & Company. Articulated joint including Belleville spring seals maintained in a preselected compressed state. 4,188,146, Cl. 403-158.000.
Steiner, Edwin G.: *See—*
Campoli, Ralph F.; Barrieres, Elie L.; Bannat, John W.; Steiner, Edwin G.; Lynch, Thomas A.; and Miller, Gary M., 4,187,783, Cl. 102-93.000.
Steiner, Karl-Ulrich: *See—*
Mislin, Roland; and Steiner, Karl-Ulrich, 4,188,187, Cl. 8-39.00B.
Stenger, Antoine: *See—*
Pitet, Guy; Cousse, Henri; Mouzin, Gilbert; and Stenger, Antoine, 4,188,387, Cl. 424-249.000.
Stephens, Donald E.: *See—*
Adams, Robert G.; Pouli, Dirk; Ridgley, Dana H.; and Stephens, Donald E., 4,188,464, Cl. 429-210.000.
Sterlini, Jacques, to CEM-Compagnie Electro-Mecanique. Method and apparatus for exchanging heat between fluids. 4,187,899, Cl. 165-1.000.
Stevens, Albert: *See—*
McMullan, James P.; and Stevens, Albert, 4,187,568, Cl. 5-451.000.
Stevens, Francis J.: *See—*
Palmer, Ansell W.; and Stevens, Francis J., 4,188,575, Cl. 324-103.00R.
Stevenson, Roy A. Signalling system. 4,188,581, Cl. 325-38.00R.
Stevenson, Walter A. Worm harvester. 4,187,946, Cl. 209-674.000.
Stikeleather, Allan, to Industrial Blast Coil Corporation. Method and apparatus for simultaneously rolling and slitting metal strip. 4,187,710, Cl. 72-204.000.
Stim, Edward M. Suction curettage device with valve control and support means for differing diameter tubes. 4,187,849, Cl. 128-278.000.
Stockl, Herbert: *See—*
Winterholler, Johann; Plantsch, Josef; Stockl, Herbert; and Gunther, Siegfried, 4,187,968, Cl. 226-92.000.
Stoepel, Kurt: *See—*
Bossert, Friedrich; Wehinger, Egbert; Meyer, Horst; Heise, Arend; Kazda, Stanislav; Stoepel, Kurt; Towart, Robertson; Vater, Wulf; and Schlossmann, Klaus, 4,188,395, Cl. 424-266.000.
Stofer, Walter: *See—*
Schmid, Pierre; Brunner, Eduard; and Stofer, Walter, 4,188,506, Cl. 179-1.50R.
Stolfa, Frank: *See—*
Czajkowski, George J.; and Stolfa, Frank, 4,188,283, Cl. 208-143.000.
Stoll, Max, deceased: *See—*
Kovats, Ervin; Demole, Edouard; Ohloff, Gunther; and Stoll, Max, deceased, 4,187,863, Cl. 131-17.00R.
Stoll, Suzanne, executrix: *See—*
Kovats, Ervin; Demole, Edouard; Ohloff, Gunther; and Stoll, Max, deceased, 4,187,863, Cl. 131-17.00R.
Stonov, Leonid D.: *See—*
Melnikov, Nikolai N.; Grapov, Artur F.; Razvodovskaya, Ljudmila V.; Popov, Petr V.; Sedykh, Aelita S.; Shapovalova, Galina K.; Abelentseva, Galina M.; Siforova, Tamara A.; Nikolaeva, Tatyana A.; Galitsina, Valentina V.; Stonov, Leonid D.; and Bakumenko, Ljudmila A., 4,188,382, Cl. 424-200.000.
Stoot, Robert C. Butt hook for a logging choker line. 4,188,141, Cl. 403-24.000.
Storage Technology Corporation: *See—*
Loran, Thomas J., 4,188,434, Cl. 428-65.000.
Stout, Glenn M. Encapsulated Hall effect device. 4,188,605, Cl. 338-32.00H.
Straub, Otto C., to Bayer Aktiengesellschaft. Process for the preparation of vaccines. 4,188,375, Cl. 424-88.000.
Streble, Bernd, to Siemens Aktiengesellschaft. Cable for transmitting low-level signals. 4,188,080, Cl. 339-14.00R.
Strecker, Helmut, to Hoechst Aktiengesellschaft. Nuclide generator for preparing radio-nuclides. 4,188,539, Cl. 250-432.0PD.
Stricharczuk, Paul T.; and Lawson, Dennis L., to B. F. Goodrich Company, The. Stereo reticulated polymeric lace-like structure and process for making the same. 4,188,448, Cl. 428-311.000.
Strickland, Kevin: *See—*
Legate, Roland A.; and Strickland, Kevin, 4,187,709, Cl. 72-56.000.
Striggow, Lewis J. Beverage container lid. 4,187,954, Cl. 220-90.400.
Stroppe, Bill: *See—*
Crean, John C.; and Stroppe, Bill, 4,188,047, Cl. 280-678.000.
Strozak, Stephen: *See—*
Krisak, Edward J.; and Strozak, Stephen, 4,188,039, Cl. 277-95.000.

Stubbs, John K.: *See*—
Campbell, Simon F.; Danilewicz, John C.; Ham, Allan L.; and Stubbs, John K., 4,188,391, Cl. 424-251.000.
Stubstad, James A.: *See*—
Dahlen, Burton L.; and Stubstad, James A., 4,187,558, Cl. 3-1.000.
Stumpp, Gerhard, to Robert Bosch GmbH. Fuel supply device. 4,187,813, Cl. 123-136.000.
Suarato, Antonino; Masi, Paolo; Bernardi, Luigi; and Arcamone, Federico, to Farmitalia Carlo Erba S.p.A. Carminomycin derivatives, their preparation and use. 4,188,377, Cl. 424-180.000.
Sugahara, Yujiro; Noshi, Yoshibumi; Naito, Hiroyuki; Takahashi, Akira; Ito, Masanori; and Tuchida, Hisashi, to Mizusawa Kagaku Kogyo Kabushiki Kaisha. Process for an electrode for a lead battery. 4,188,268, Cl. 204-2.100.
Sugawara, Toru: *See*—
Suzuki, Seiko; Takasaka, Masahiro; Sugawara, Toru; and Takahasi, Toru, 4,188,623, Cl. 340-595.000.
Sugiyama, Masatoshi, to Fuji Photo Film Co., Ltd. Process for the production of 3-substituted amino-5-pyrazolones. 4,188,489, Cl. 548-360.000.
Suh, Nam P.; and Malguarnera, Salvatore C., to Massachusetts Institute of Technology. Method and apparatus for the treatment of particulate materials. 4,188,185, Cl. 432-27.000.
Sukolics, Ronald D., to Swiss Aluminium Ltd. Thermal windows. 4,187,657, Cl. 52-397.000.
Sulphur Development Institute of Canada: *See*—
Gillott, Jack E.; Jordaan, Ian J.; Loov, Robert E.; and Shrive, Nigel G., 4,188,230, Cl. 106-70.000.
Sumitomo Chemical Company, Limited: *See*—
Sano, Takezo; and Sasaki, Masao, 4,188,273, Cl. 204-158.0HE.
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisan Industry Co., Ltd. Air-fuel ratio controlling system for an internal combustion engine. 4,187,816, Cl. 123-139.0AW.
Sung, Fong G. Inner sole for a shoe. 4,187,622, Cl. 36-44.000.
Superior Cable Corporation: *See*—
Dickey, Donald F., 4,188,082, Cl. 339-36.000.
Sussenbacher, Florian: *See*—
Kissich, Arnulf; and Sussenbacher, Florian, 4,188,069, Cl. 299-73.000.
Sutton, Jay D.: *See*—
Corbett, Wendell E.; and Sutton, Jay D., 4,188,160, Cl. 406-58.000.
Suzuki, Hideo: *See*—
Murata, Atsuo; Tsuchiya, Shuji; Suzuki, Hideo; and Ikeda, Hisao, 4,188,498, Cl. 568-875.000.
Suzuki, Seiko; Takasaka, Masahiro; Sugawara, Toru; and Takahasi, Toru, to Hitachi, Ltd. Temperature responsive apparatus employing a thermocouple. 4,188,623, Cl. 340-595.000.
Suzuki, Shigeto, to Chevron Research Company. Hydrogen fluoride removal from glycolic acid. 4,188,494, Cl. 562-580.000.
Suzuki, Shoichi, to Nihon Dixie Company, Limited. Method for the manufacture of a paper container. 4,187,768, Cl. 93-39.10R.
Suzuki, Takeshi; Furukawa, Yasuyoshi; Tomoda, Masayasu; and Ueta, Yutaka, to Daikin Kogyo Co., Ltd. Elastomeric composition comprising fluoroelastomer and epicholorohydrin elastomer. 4,188,352, Cl. 525-187.000.
Suzuki, Yasuo; and Hirai, Tosihisa, to Matsushita Electric Works, Ltd. Stator of uni-directional self starting synchronous motor. 4,188,555, Cl. 310-162.000.
Swartz, Henry D., to Standard Oil Company (Indiana). Machine for the fabrication of plasticboard. 4,188,253, Cl. 156-361.000.
Swift, Joseph A., to Xerox Corporation. Solvent extracted heat fuser member. 4,188,423, Cl. 427-444.000.
Swingler, Donald L., to Commonwealth Scientific and Industrial Research Organization. Flanged cylindrical electron multipliers. 4,188,560, Cl. 313-105.00R.
Swiss Aluminium Ltd.: *See*—
Sukolics, Ronald D., 4,187,657, Cl. 52-397.000.
Sybron Corporation: *See*—
Grell, Helmut; and Engelhardt, Achim, 4,187,559, Cl. 3-1.910.
Syntex (U.S.A.) Inc.: *See*—
Edwards, John A., 4,188,385, Cl. 424-241.000.
T. Y. Lin International: *See*—
Lin, Tung-Yen; and Yang, Yue-Chyou, 4,187,660, Cl. 52-747.000.
Tabak, Samuel A.; and Morrison, Roger A., to Mobile Oil Corporation. Manufacture of benzene, toluene and xylene. 4,188,282, Cl. 208-134.000.
Tadanier, John S.; Martin, Jerry R.; and Kurath, Paul, to Abbott Laboratories. 4-N-Acylfortimicin B derivatives and the chemical conversion of fortimicin B to fortimicin A. 4,188,319, Cl. 260-112.50R.
Taddeo, Michael. Cigarette holder for ash receptacles. 4,187,864, Cl. 131-242.000.
Taguchi, Masahiro: *See*—
Tsukamoto, Goro; Yoshino, Koichiro; Kohno, Toshihiko; Taguchi, Masahiro; Dezawa, Katsumi; Kagaya, Hajime; Ito, Keiso; and Nose, Takashi, 4,188,486, Cl. 546-271.000.
Taguchi, Tetsuya: *See*—
Uchiyama, Takashi; Taguchi, Tetsuya; and Mashimo, Yukio, 4,188,104, Cl. 354-31.000.
Takagi, Izumi; and Adachi, Shigeo, to Kawasaki Jukogyo Kabushiki Kaisha. Sheave assembly for V-belt type infinitely variable transmissions. 4,187,732, Cl. 74-230.17M.
Takahashi, Akira: *See*—
Sugahara, Yujiro; Noshi, Yoshibumi; Naito, Hiroyuki; Takahashi, Akira; Ito, Masanori; and Tuchida, Hisashi, 4,188,268, Cl. 204-2.100.
Takahashi, Hiroshi; Nakao, Kiyoshi; and Katagiri, Masaaki, to Hitachi Chemical Company, Ltd. Baseboard for printed circuit board and method of producing the same. 4,188,415, Cl. 427-97.000.
Takahashi, Kenji: *See*—
Iwanaga, Sadaaki; Morita, Takashi; Nakamura, Shin; Takahashi, Kenji; and Niwa, Makoto, 4,188,264, Cl. 23-230.00B.
Takahashi, Nobuaki: *See*—
Kasuga, Masao; Takahashi, Nobuaki; Sato, Masaaki; Seki, Kohji; Mori, Toshinori; and Iwahara, Makoto, 4,188,504, Cl. 179-1.0GP.
Takahashi, Nobuhiro; and Hirata, Kenichi, to Nippon Kokan Kabushiki Kaisha. Method and apparatus for heat-treating metallic material. 4,188,243, Cl. 148-155.000.
Takahasi, Toru: *See*—
Suzuki, Seiko; Takasaka, Masahiro; Sugawara, Toru; and Takahasi, Toru, 4,188,623, Cl. 340-595.000.
Takaki, Noboru: *See*—
Yamada, Hirofumi; Takaki, Noboru; and Masuda, Michio, 4,187,616, Cl. 34-13.000.
Takasaka, Masahiro: *See*—
Suzuki, Seiko; Takasaka, Masahiro; Sugawara, Toru; and Takahasi, Toru, 4,188,623, Cl. 340-595.000.
Takeda, Keiji: *See*—
Fujiwara, Masato; Nirasawa, Mitsuharu; and Takeda, Keiji, 4,188,212, Cl. 430-69.000.
Takemura, Shinichiro: *See*—
Muraki, Ryoji; Takemura, Shinichiro; Ohashi, Yoshio; and Ichioka, Athushi, 4,188,190, Cl. 23-232.00R.
Takenoya, Hideaki; and Makabe, Machiro, to Janome Sewing Machine Co. Ltd. Sewing machine with an electronic pattern stitch control system. 4,187,789, Cl. 112-158.00E.
Takeuchi, Yuzo: *See*—
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, 4,187,816, Cl. 123-139.0AW.
Talbert, Sherwood G.; Klausing, Thomas A.; and Yates, Jan B., to United States of America, Navy. Method and means for injecting hot liquid when pumping cold liquid. 4,188,172, Cl. 417-53.000.
Tallon, Thomas G.; and Harris, Gerald A., to Chrysler Corporation. Vehicle headlamp and mounting assembly. 4,188,655, Cl. 362-80.000.
Tan, Yoichi, to Nippon Electric Co., Ltd. Bit error detecting circuit for use in a digital signal transmission line. 4,188,615, Cl. 340-146.10R.
Tanaka, Hirokazu: *See*—
Yoshioka, Toshihiro; Itaya, Shikiho; Arima, Yusaku; and Tanaka, Hirokazu, 4,188,365, Cl. 423-239.00A.
Tanaka, Shinsaku, to Tanashin Denki Co., Ltd. Cassette type tape recorder. 4,188,647, Cl. 360-105.000.
Tanaka, Taku: *See*—
Yamauchi, Kazuhisa; Tanaka, Taku; and Kawai, Syuji, 4,188,117, Cl. 356-237.000.
Tanashin Denki Co., Ltd.: *See*—
Tanaka, Shinsaku, 4,188,647, Cl. 360-105.000.
Tanzawa, Misao: *See*—
Idenawa, Hiroyuki; Tanzawa, Misao; and Ohno, Yukihiro, 4,188,109, Cl. 355-3.0FU.
Tapco International, Inc.: *See*—
Freeman, Murray E.; and Shipper, Harmon E., 4,187,872, Cl. 137-454.600.
Taylor, Glenn N., to Kendall Company, The. Adapter assembly. 4,187,848, Cl. 128-247.000.
Taylor, John E. Formation of barriers. 4,188,153, Cl. 405-34.000.
TDK Electronics Company, Limited: *See*—
Okamura, Masatoshi; and Shiba, Haruo, 4,187,998, Cl. 242-199.000.
Yamaguchi, Norishige; Ohya, Kazuo; Kohmoto, Osamu; and Fujishima, Hiroki, 4,188,211, Cl. 75-170.000.
Technical Exhibits Corporation: *See*—
Chaffee, William H., 4,187,649, Cl. 52-36.000.
Tecneco S.p.A.: *See*—
Munari, Stelio; Vigo, Fernando; Capannelli, Gustavo; Uliana, Claudio; and Bottino, Aldo, 4,188,354, Cl. 264-22.000.
Tektronix, Inc.: *See*—
Janko, Bozidar, 4,188,563, Cl. 313-460.000.
Teledyne Industries, Inc.: *See*—
Petrovic, John E., 4,187,986, Cl. 239-449.000.
Teledyne Industries Inc. (Geotech Division): *See*—
Kerr, James D., 4,188,612, Cl. 367-160.000.
Telesync Corporation: *See*—
Nicolai, Carl R.; Raike, William M.; and Miller, David L., 4,188,580, Cl. 325-32.000.
Teletronics Co., Inc. of Clifton: *See*—
Junak, Edward M., 4,188,182, Cl. 431-80.000.
Temin, Samuel C., to Colgate-Palmolive Company. Dental restorative compositions containing titanium silicate. 4,188,317, Cl. 260-42.530.
te Raa, Gerhardus A.: *See*—
Withoos, Wilhelmus H. C.; te Raa, Gerhardus A.; and Sprengers, Johannes, 4,188,358, Cl. 264-255.000.
Terakawa, Toshiaki: *See*—
Miwa, Hirohide; and Terakawa, Toshiaki, 4,188,566, Cl. 315-169.400.
Ter-Davtian, Zorik S.: *See*—
Sarkisian, Levon A.; Matsoian, Stepan G.; Gabzimalian, Vagram G.; Mailian, Shaen M.; Galstian, Albert P.; Azarian, Vazgen K.; Ter-Davtian, Zorik S.; Gevorkian, Raya G.; Gevorkian, Ogden

A.; Khudoian, Korjun L.; Ovsepian, Lavrenty A.; Arutjunova, Amalia A.; and Mkrtchian, Foerbakh V., 4,188,406, Cl. 426-3.000.

Terenzoni, Amerigo. Furniture construction. 4,188,066, Cl. 297-440.000.

Terlecky, Boris S.: *See—*
Yeates, Richard; Terlecky, Boris S.; and Shah, Jagdish K., 4,187,600, Cl. 29-564.000.

Terry, Clegia L. Helical drive trains which eliminate the need for thrust bearings. 4,187,735, Cl. 74-410.000.

Texaco Development Corporation: *See—*
Waddill, Harold G.; and Moss, Philip H., 4,188,474, Cl. 528-111.000.

Texaco Inc.: *See—*
Reinhard, Russell R.; and Yaffe, Roberta, 4,188,298, Cl. 252-46.600.

Texas Instruments Incorporated: *See—*
Frantz, Gene A.; and Brantingham, George L., 4,188,626, Cl. 340-711.000.
Kilby, Jack S.; McKee, William R.; and Porter, Wilbur A., 4,188,177, Cl. 425-5.000.
McElroy, David J., 4,187,602, Cl. 29-571.000.

Textron Inc.: *See—*
Moertel, George B., 4,187,791, Cl. 112-265.200.
Prew, Raymond A., Jr., 4,187,971, Cl. 227-125.000.

Thiewes, Richard B.; and Nelson, Donald W. Apparatus for controlling video tape presentation. 4,188,644, Cl. 360-14.000.

Thimm, Max. Device for applying flowing masses to the surface of a workpiece. 4,187,802, Cl. 118-708.000.

Thimsen, Mark J.: *See—*
Ivers, Robert P.; and Thimsen, Mark J., 4,187,613, Cl. 33-174.00G.

Thivend, Pierre; Mercier-Greenwood, Christiane; and Guilbot, Andre, to I.N.R.A. Automatic method for the determination of starch. 4,188,466, Cl. 435-18.000.

Thomas, Robert D., to Smith International, Inc. Rock bit and method of manufacture. 4,187,743, Cl. 76-108.00A.

Thompson, Howard J. Identification device. 4,187,628, Cl. 40-10.00D.

Thompson, Norman, to Beta Aluminium Products Limited. Louvre windows. 4,187,641, Cl. 49-403.000.

Thompson, Roy F. Device for obtaining lateral and vibrational movement within rotatable receptacles. 4,188,129, Cl. 366-108.000.

Thomson-CSF: *See—*
D'Auria, Luigi; Jacques, Andre; and Malsot, Christian, 4,188,087, Cl. 350-96.200.
Milosevic, Ljubimko, 4,188,630, Cl. 343-9.00R.

Throp, Arnold M., to Metal Box Limited. Closures of liquid product containers. 4,188,457, Cl. 428-542.000.

Thuillier, Germaine, born Nachmias; and Mignonac, Sylviane S. J., born Mondon, to Albert Rolland S.A. Phenoxy pyridazinones and anorexigenic use thereof. 4,188,388, Cl. 424-250.000.

Timesavers, Inc.: *See—*
Lind, Fred W., 4,187,645, Cl. 51-135.0BT.

Timossi, Giovanni: *See—*
Aliprandi, Giovanni; Ricci, Roberto; and Timossi, Giovanni, 4,187,965, Cl. 222-600.000.

Tokyo Shibaura Electric Co. Ltd.: *See—*
Muraki, Ryoji; Takemura, Shinichiro; Ohashi, Yoshio; and Ichioka, Athushi, 4,188,190, Cl. 23-232.00R.
Muraki, Ryoji; Takemura, Shinichiro; Ohashi, Yoshio; and Ichioka, Athushi, 4,188,190, Cl. 23-232.00R.
Sato, Shigeru, 4,187,857, Cl. 128-660.000.
Yamamura, Toshio, 4,188,558, Cl. 313-55.000.

Tolsma, Auke. Method for manufacturing thermally insulated buildings, construction elements suitable for application in this method and a method of manufacturing the building construction elements. 4,187,651, Cl. 52-79.100.

Tombari, Aldo L. Athletic glove. 4,187,557, Cl. 2-19.000.

Tomoda, Masayasu: *See—*
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Tone Commander Systems, Inc.: *See—*
Smith, Maurice I.; Gillen, John D.; and Edwards, Gerald L., 4,188,511, Cl. 179-99.00A.

Tonka Corporation: *See—*
Pauly, Ronald R., 4,187,636, Cl. 46-201.000.

Tormala, Pertti: *See—*
Rautavuori, Jorma K.; and Tormala, Pertti, 4,188,369, Cl. 423-449.000.

Touchton, James J.: *See—*
Sordello, Frank J.; Darrah, Edward R.; and Touchton, James J., 4,188,646, Cl. 360-77.000.

Tovel S.p.A.: *See—*
Gottardo, Guido, 4,188,255, Cl. 156-384.000.

Towart, Robertson: *See—*
Bossert, Friedrich; Wehinger, Egbert; Meyer, Horst; Heise, Arend; Kazda, Stanislav; Stoepel, Kurt; Towart, Robertson; Vater, Wulf; and Schlossmann, Klaus, 4,188,395, Cl. 424-266.000.

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Townsend, Ray T.; and Smith, David W., 4,187,583, Cl. 17-49.000.

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Nanpei, Masaru; Fujimura, Toshiaki; Kouda, Hajime; Kasho, Yoshihiro; and Etoh, Kuniomi, 4,188,221, Cl. 430-288.000.

Toyo Kagaku Kabushiki Kaisha: *See—*
Asakura, Hiroshi; Chimura, Ippei; Kitazume, Keisuke; Kaneko, Yoshiyuki; Fuse, Shirou; and Ueno, Akio, 4,188,439, Cl. 428-215.000.
Asakura, Hiroshi; Chimura, Ippei; Kitazume, Keisuke; Kaneko, Yoshiyuki; Fuse, Shirou; and Ueno, Akio, 4,188,442, Cl. 428-216.000.

Toyo Kogyo Co., Ltd.: *See—*
Morinaga, Teruhiko; and Nishikawa, Ikuo, 4,187,642, Cl. 49-406.000.

Toyo Seikan Kaisha, Ltd.: *See—*
Shibasaki, Kyuichi, 4,187,718, Cl. 73-52.000.

Toyoda Gosei Co., Ltd.: *See—*
Ohno, Tsuneo; Maeno, Kunio; Kasuya, Takahiko; and Nakajima, Takao, 4,188,424, Cl. 428-572.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Ishikawa, Masakazu; Shibatani, Juichi; and Ito, Sadayoshi, 4,188,073, Cl. 303-87.000.
Katoh, Kenji; and Ogita, Tamotu, 4,187,811, Cl. 123-119.00A.
Kobayashi, Toshihiko; and Oonishi, Toshinari, 4,187,815, Cl. 123-122.00H.
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, 4,187,816, Cl. 123-139.0AW.

Trailer Train Company: *See—*
Yeates, Richard; Terlecky, Boris S.; and Shah, Jagdish K., 4,187,600, Cl. 29-564.000.

Traut, Earl W. Variable displacement rotary fluid energy converter. 4,188,176, Cl. 418-24.000.

Tregoning, Robert H. Cosmic and solar ray hot water heater. 4,187,832, Cl. 126-443.000.

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Johnson, Gary R., 4,187,920, Cl. 175-267.000.

Trico Products Corporation: *See—*
Deibel, Raymond A.; Gowans, Neil A.; and Riester, William C., 4,187,576, Cl. 15-250.420.

Trienekens, Matthias: *See—*
Flender, Hans F., 4,187,775, Cl. 100-39.000.

Trinchera, Luigi, to California Cedar Products Company. Method of brazing tips on circular saw teeth. 4,188,524, Cl. 219-85.0CM.

Tronconi, Giovanni: *See—*
Scolastico, Carlo; and Tronconi, Giovanni, 4,188,484, Cl. 544-317.000.

Trost, Werner: *See—*
Bauer, Wilhelm; Heinrich, Kurt; Klie, Wolfgang; Rau, Wolfgang; and Trost, Werner, 4,188,059, Cl. 296-188.000.

Trutzschler GmbH & Co. KG: *See—*
Trutzschler, Hermann, 4,187,584, Cl. 19-81.000.

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TRW Inc., Systems & Energy: *See—*
James, Gordon E., 4,187,930, Cl. 184-1.00R.

Tsoutsas, Peter A., to Permacor, Inc. Inductor with conducting core of sintered powdered metal. 4,188,603, Cl. 336-75.000.

Tsuchiya, Shuji: *See—*
Murata, Atsuo; Tsuchiya, Shuji; Suzuki, Hideo; and Ikeda, Hisao, 4,188,498, Cl. 568-875.000.

Tsuji, Kunio; Hisano, Katsukuni; Sakai, Akira; and Nakamura, Shozo, to Hitachi, Ltd. Method and system for effecting control governing of a steam turbine. 4,187,685, Cl. 60-660.000.

Tsukamoto, Goro; Yoshino, Koichiro; Kohno, Toshihiko; Taguchi, Masahiro; Dezawa, Katsumi; Kagaya, Hajime; Ito, Keiso; and Nose, Takashi, to Kanebo, Ltd. 2-Substituted benzimidazole compounds. 4,188,486, Cl. 546-271.000.

Tsukumo, Zenzaburo, to NTN Toyo Bearing Co. Ltd.; and Tsukumo, Zenzaburo. Construction of pendulum arm type high sensitivity self-aligning weighting arm. 4,187,588, Cl. 19-281.000.

Tuchida, Hisashi: *See—*
Sugahara, Yujiro; Noshi, Yoshibumi; Naito, Hiroyuki; Takahashi, Akira; Ito, Masanori; and Tuchida, Hisashi, 4,188,268, Cl. 204-2.100.

Tullman, Edward J.: *See—*
Ross, Roger J.; and Tullman, Edward J., 4,187,794, Cl. 112-308.000.

Tune, John B.: *See—*
Clarke, David E.; Davies, James F.; and Tune, John B., 4,188,304, Cl. 252-93.000.

Turk, Abraham A.: *See—*
Simuro, Ernest G.; Turk, Abraham A.; and Turk, Nathan M., 4,187,607, Cl. 30-152.000.

Turk, Nathan M.: *See—*
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Turner, James B., Jr.: *See—*
Hall, John R., 4,187,647, Cl. 52-20.000.
Hall, John R., 4,188,151, Cl. 404-26.000.

Turner, John L.: *See—*
Nicholson, John S.; and Turner, John L., 4,188,491, Cl. 562-492.000.

Turner, Lloyd S., to Basic Products Development Company, Inc. Security container and closure apparatus. 4,187,953, Cl. 215-301.000.

Ubezio, Lorenzo, to Reppisch-Werke Aktiengesellschaft. Drafting board base. 4,188,007, Cl. 248-411.000.

Uchiyama, Takashi; Taguchi, Tetsuya; and Mashimo, Yukio, to Canon Kabushiki Kaisha. Automatic control device for electronic flash. 4,188,104, Cl. 354-31.000.
Uddeholms Aktiebolag: *See*—
Johnsson, Mans K. O.; and Eriksson, Lars A., 4,188,206, Cl. 75-60.000.
UEC Manufacturing Company: *See*—
Byrne, James E., 4,187,927, Cl. 182-2.000.
Ueno, Akio: *See*—
Asakura, Hiroshi; Chimura, Ippei; Kitazume, Keisuke; Kaneko, Yoshiyuki; Fuse, Shirou; and Ueno, Akio, 4,188,439, Cl. 428-215.000.
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Munari, Stelio; Vigo, Fernando; Capannelli, Gustavo; Uliana, Claudio; and Bottino, Aldo, 4,188,354, Cl. 264-22.000.
Unangst, Paul C.: *See*—
Brown, Richard E.; and Unangst, Paul C., 4,188,326, Cl. 260-326.290.
Union Carbide Corporation: *See*—
Kaplan, Leonard; and Cotton, Frank A., 4,188,335, Cl. 260-449.00L.
Lolachi, Houshang; and Carminucci, Robert N., 4,187,846, Cl. 128-214.00R.
Smith, Oliver W.; Koleske, Joseph V.; and Knopf, Robert J., 4,188,477, Cl. 528-288.000.
Vicik, Stephen J.; Kohler, William J.; and Funderburk, James O., Jr., 4,188,350, Cl. 525-232.000.
Union Special Corporation: *See*—
Boser, Ronald J.; Siegel, Walter P.; and Picciotti, Michael F., 4,187,792, Cl. 112-286.000.
United Geophysical Corporation: *See*—
Edwards, Charles M.; and Walter, William C., 4,188,611, Cl. 367-41.000.
United States of America
Agriculture: *See*—
Wasley, William L.; and Ingenthron, Walter W., Jr., 4,188,422, Cl. 28-167.000.
Air Force: *See*—
Greger, Anthony, 4,188,001, Cl. 244-151.00B.
Kuhn, Ralph F., Jr., 4,187,595, Cl. 29-157.00C.
Siegman, Anthony E.; Holmes, Neil C.; and Artusy, Max T., 4,188,591, Cl. 331-94.50P.
Wakeman, Thomas G., 4,187,675, Cl. 60-39.750.
Army: *See*—
Campoli, Ralph F.; Barrieres, Elie L.; Bannat, John W.; Steiner, Edwin G.; Lynch, Thomas A.; and Miller, Gary M., 4,187,783, Cl. 102-93.000.
Golden, Stephen P.; and Jennings, Charles T., 4,187,723, Cl. 73-295.000.
Grace, Fred I., 4,187,782, Cl. 102-56.0SC.
Jacobs, Paul L., 4,188,576, Cl. 324-163.000.
Pagano, Carmine N.; and Di'Giorgio, Anthony D., 4,188,503, Cl. 178-88.000.
Petty, Jon, 4,187,758, Cl. 86-1.00B.
Energy: *See*—
Cho, Nakwon, 4,187,764, Cl. 91-442.000.
Goedicke, Friedrich E., 4,188,038, Cl. 277-64.000.
Knight, Charles E., Jr.; and Pollard, Roy E., 4,187,738, Cl. 74-572.000.
Lindsay, Malcolm, 4,188,173, Cl. 417-424.000.
Weinstein, Berthold W.; and Willenborg, David L., 4,188,118, Cl. 356-244.000.
Health, Education and Welfare: *See*—
Montgomery, John A., 4,188,378, Cl. 424-180.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Wolf, Charles B.; and Meyer, Thomas N. Method of producing silicon. 4,188,368, Cl. 423-350.000.
Navy: *See*—
De Simone, David N., 4,187,570, Cl. 9-14.000.
Dougherty, Richard H.; and Fealy, Thomas E., 4,188,631, Cl. 343-705.000.
Ess, John O., 4,187,796, Cl. 114-312.000.
Hendrickson, Richard C., 4,187,871, Cl. 137-112.000.
Holt, Lloyd J., 4,187,760, Cl. 89-1.50E.
Holt, Lloyd J.; and Panlaqui, Clayton E., 4,187,761, Cl. 89-1.50R.
Jones, Harry S.; Kirkpatrick, David B.; and Wilson, Robert G., 4,187,779, Cl. 102-18.00M.
Masters, Blake W.; and Moran, Robert D., 4,188,570, Cl. 318-616.000.
McDonald, Jimmie R.; and Baronavski, Andrew P., 4,188,120, Cl. 356-318.000.
O'Neil, Scott M.; and Payne, Howard H., 4,187,676, Cl. 60-255.000.
Shajenko, Peter, 4,188,096, Cl. 350-358.000.
Talbert, Sherwood G.; Klausing, Thomas A.; and Yates, Jan B., 4,188,172, Cl. 417-53.000.
Toy, Henry; Bernstein, Phillip; and Van der Zwaan, Johan C., 4,187,759, Cl. 89-1.00B.
U.S. Philips Corporation: *See*—
de Haan, Maarten R., 4,188,638, Cl. 358-4.000.
Dijkstra, Rinse; van den Broek, Arnoldus J. M.; and Lippits, Gerardus J. M., 4,188,433, Cl. 428-64.000.
Dittrich, Jurgen; Heinzerling, Jurgen; Meijer, Dietrich E.; Mollendorf, Ralf; and Wolf, Friedrich, 4,188,640, Cl. 358-111.000.
Hodemaekers, Andreas M. L., 4,188,625, Cl. 340-642.000.
Reiniger, Friedrich, 4,188,540, Cl. 250-439.00R.
Schayes, Raymond G.; Homan, Pieter; and Rothgordt, Ulf, 4,188,643, Cl. 358-280.000.
Van Oostrum, Karel J., 4,188,562, Cl. 313-402.000.
Withoos, Wilhelmus H. C.; te Raa, Gerhardus A.; and Sprengers, Johannes, 4,188,358, Cl. 264-255.000.
Zegers, Antonius P. F.; and Compen, Johannes M. A. A., 4,188,564, Cl. 313-479.000.
United Technologies Corporation: *See*—
Buczek, Carl J.; Freiberg, Robert J.; Fradin, David W.; and Chenausky, Peter P., 4,188,592, Cl. 331-94.50G.
University of Alabama, The: *See*—
Urry, Dan W.; and Okamoto, Kouji, 4,187,852, Cl. 128-334.00R.
University of Dayton: *See*—
Chasteen, Jack W., 4,188,237, Cl. 134-2.000.
University of Iowa Research Foundation: *See*—
Chan, Kai C., 4,187,611, Cl. 433-225.000.
University of Minnesota, Regents of: *See*—
Gassman, Paul G.; and Cue, Berkeley W., 4,188,325, Cl. 260-325.00R.
University of Mississippi, The: *See*—
Hufford, Charles D., 4,188,392, Cl. 424-258.000.
University of Rhode Island: *See*—
Felbeck, George T., Jr., 4,188,193, Cl. 48-197.00R.
University of Rochester, The: *See*—
Deckman, Harry W.; and Halpern, Gerald M., 4,188,532, Cl. 250-336.000.
University of Southampton, The: *See*—
Binns, Kenneth J., 4,188,554, Cl. 310-156.000.
University of Southern California: *See*—
Diels, Jean-Claude, 4,188,538, Cl. 250-423.00P.
University Patents, Inc.: *See*—
Allen, Robert H., 4,188,189, Cl. 23-230.300.
Uno, Masahiro: *See*—
Watanabe, Atsuo; Ishizawa, Hidenori; and Uno, Masahiro, 4,188,534, Cl. 250-345.000.
UOP Inc.: *See*—
Cheshire, Ernest L., 4,188,064, Cl. 297-367.000.
Czajkowski, George J.; and Stolfa, Frank, 4,188,283, Cl. 208-143.000.
Uozumi, Junzo: *See*—
Sumiyoshi, Masaharu; Sekiya, Setsuo; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, 4,187,816, Cl. 123-139.0AW.
Upat GmbH & Co: *See*—
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Upjohn Company, The: *See*—
Bundy, Gordon L., 4,188,332, Cl. 260-343.410.
Martin, David G., 4,188,324, Cl. 548-240.000.
Nelson, Norman A., 4,188,468, Cl. 542-429.000.
Sih, John C., 4,188,481, Cl. 542-426.000.
Ureda, Mark S.: *See*—
Henricksen, Clifford A.; and Ureda, Mark S., 4,187,926, Cl. 181-192.000.
Urry, Dan W.; and Okamoto, Kouji, to University of Alabama, The. Synthetic elastomeric insoluble cross-linked polypentapeptide. 4,187,852, Cl. 128-334.00R.
USV Pharmaceutical Corporation: *See*—
Guarino, Richard A., 4,188,404, Cl. 424-330.000.
Vaello, Donald B.: *See*—
Fertl, Walter H.; and Vaello, Donald B., 4,187,908, Cl. 166-254.000.
Valenta, Rudolph C., to Oil-Dri Corporation of America. Process for pelletizing sorptive mineral fines. 4,187,803, Cl. 119-1.000.
Valeron Corporation, The: *See*—
Smith, David L.; and Scherr, Norman J., Jr., 4,187,646, Cl. 51-165.770.
Zweekly, Raymond T., 4,188,162, Cl. 408-199.000.
Valmet: *See*—
Kankaanpaa, Matti, 4,188,262, Cl. 162-205.000.
Valore, Rudolph C. Methods of preparing iron oxide mortars or cements with admixtures and the resulting products. 4,188,231, Cl. 106-90.000.
Van Dresser Corporation: *See*—
Doerer, Richard P., 4,188,440, Cl. 428-215.000.
van Bergen, Johannes A. W. P. Ear ornament clips. 4,187,696, Cl. 63-14.00C.
Van Cauter, Albert: *See*—
Van Laethem, Robert; Leclercq, Robert; Capouillet, Phileas; and Van Cauter, Albert, 4,188,199, Cl. 65-60.00C.
van den Berg, Jan W.: *See*—
Nagel, Dennis M.; O'Neal, Douglas; Petroskey, Paul W.; van den Berg, Jan W.; Wildes, Donald V.; and Wu, David C., 4,188,665, Cl. 364-200.000.
van den Broek, Arnoldus J. M.: *See*—
Dijkstra, Rinse; van den Broek, Arnoldus J. M.; and Lippits, Gerardus J. M., 4,188,433, Cl. 428-64.000.
van der Lely, Cornelis. Soil cultivating implements. 4,187,914, Cl. 172-53.000.

van der Lely, Cornelis. Soil cultivating implements. 4,187,915, Cl. 172-59.000.
Van der Zwaan, Johan C.: *See—*
Toy, Henry; Bernstein, Phillip; and Van der Zwaan, Johan C., 4,187,759, Cl. 89-1.00B.
Van Laethem, Robert; Leclercq, Robert; Capouillet, Phileas; and Van Cauter, Albert, to BFG Glassgroup. Metal compound coating on a face of a continuously longitudinally moving glass ribbon and apparatus for use in forming such coating. 4,188,199, Cl. 65-60.00C.
Van Linder, Basil R.; Van Linder, Ronald C.; and McLane, Fredrick G., to Kalamazoo Manufacturing Company. Metal dispensing valve assembly for battery grid casting machine. 4,187,966, Cl. 222-601.000.
Van Linder, Ronald C.: *See—*
Van Linder, Basil R.; Van Linder, Ronald C.; and McLane, Fredrick G., 4,187,966, Cl. 222-601.000.
van Mullekom, Hubert P., to Ruti-te Strake B.V. Supply system for a pneumatic weaving machine. 4,187,888, Cl. 139-435.000.
Van Namen, Dirk J.: *See—*
Huizer, Leendert; Van Namen, Dirk J.; and Oranje, Pieter J. D., 4,188,497, Cl. 568-799.000.
Van Oostrum, Karel J., to U.S. Philips Corporation. Color display tube and method of manufacturing such a color display tube. 4,188,562, Cl. 313-402.000.
Van Paassen, Nicolaas I.: *See—*
Aalbers, Johan G.; and Van Paassen, Nicolaas I., 4,188,311, Cl. 252-551.000.
Van Rooijen, Gerrit: *See—*
Langeraar, Huibert B.; and Van Rooijen, Gerrit, 4,188,628, Cl. 343-5.0SA.
Varen Technology: *See—*
Vaughan, Ronald J., 4,188,308, Cl. 252-413.000.
Varju, Gyula: *See—*
Juhasz, Zoltan; and Varju, Gyula, 4,188,233, Cl. 106-97.000.
Vater, Wulf: *See—*
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Vaughan, Ronald J., to Varen Technology. Conversion of pendant sulfonate groups to sulfonic acid groups on perfluorvinylether-tetrafluoroethylene copolymer catalysts. 4,188,308, Cl. 252-413.000.
VDO Adolf Schindling AG: *See—*
Mann, Arnold, 4,187,734, Cl. 74-405.000.
Velinsky, Milton: *See—*
Sinko, Michael J.; and Velinsky, Milton, 4,187,981, Cl. 235-488.000.
Vella, Alexander J., to Pace Incorporated. Apparatus including general purpose desolderer and means for converting the general purpose desolderer to either a soldering iron or a special purpose desolderer. 4,187,972, Cl. 228-20.000.
Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft: *See—*
Kissich, Arnulf; and Sussenbacher, Florian, 4,188,069, Cl. 299-73.000.
Vernon, Roger J.: *See—*
Graham, James J.; and Vernon, Roger J., 4,188,290, Cl. 210-21.000.
Vetter, Werner: *See—*
Hamma, Karlmann; Ott, Anton; Vetter, Werner; and Chatterjee, Arun, 4,187,739, Cl. 74-732.000.
Vial, Jean: *See—*
Ducret, Jacques; Gaulliard, Jean-Michel; and Vial, Jean, 4,188,381, Cl. 424-199.000.
Vicik, Stephen J.; Kohler, William J.; and Funderburk, James O., Jr., to Union Carbide Corporation. Olefin polymer blends and films therefrom. 4,188,350, Cl. 525-232.000.
Victor Company of Japan, Limited: *See—*
Kasuga, Masao; Takahashi, Nobuaki; Sato, Masaaki; Seki, Kohji; Mori, Toshinori; and Iwahara, Makoto, 4,188,504, Cl. 179-1.0GP.
Naruse, Tunehide; Sasaki, Yasushi; and Matsumoto, Yukio, 4,188,301, Cl. 252-62.540.
Vigander, Kjell, to A/S Hoyer-Ellefsen. Marine structure. 4,188,157, Cl. 405-210.000.
Vignon, Louis, to Heberlein Hispano SA. Textile machine having hydraulically controlled drafting rollers. 4,187,587, Cl. 19-272.000.
Vigo, Fernando: *See—*
Munari, Stelio; Vigo, Fernando; Capannelli, Gustavo; Uliana, Claudio; and Bottino, Aldo, 4,188,354, Cl. 264-22.000.
Villari, Frank K., to Kendall Company, The. Arterial blood collection device. 4,187,860, Cl. 128-763.000.
Vincent, William T.: *See—*
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Virginia Chemicals Inc.: *See—*
Schumacher, Ernest W., 4,187,695, Cl. 62-505.000.
Vivant, Gilbert: *See—*
Cerny, Jacqueline; and Vivant, Gilbert, 4,188,313, Cl. 260-37.0EP.
Voerman, Simon; Persoons, Cornelis J.; and Ritter, Fridolin J., to Nederlandse Organisatie Voor Toegepast-Natuurwetenschappe-Lijk Onderzoek Ten Behoeve Van Nijverheid, Handel En-Verkeer. Attractant for the potato moth and the preparation of the former. 4,188,374, Cl. 424-84.000.
Voest-Alpine Aktiengesellschaft: *See—*
Patuzzi, Alexander; and Eysn, Manfred, 4,188,021, Cl. 266-88.000.
Vogel, John D., to Singer Company, The. Stepper disk adder for pattern stitch sewing machines. 4,187,790, Cl. 112-158.00E.
Volker, Herbert; Koberstein, Edgar; Bozon, Alfred; and Hensel, Jorg, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Shaped catalyst and process for its production. 4,188,309, Cl. 252-466.00J.
Vollema, Gerlof: *See—*
Bruins, Antonius H. N. M.; and Vollema, Gerlof, 4,188,338, Cl. 260-500.50H.
Voller, Ronald L. Dye metering system. 4,187,961, Cl. 222-133.000.
Volterra, Giovanna: *See—*
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Vsesojuzny Nauchno, et al.: *See—*
Melnikov, Nikolai N.; Grapov, Artur F.; Razvodovskaya, Ljudmila V.; Popov, Petr V.; Sedykh, Aelita S.; Shapovalova, Galina K.; Abelentseva, Galina M.; Siforova, Tamara A.; Nikolaeva, Tatyana A.; Galitsina, Valentina V.; Stonov, Leonid D.; and Bakumenko, Ljudmila A., 4,188,382, Cl. 424-200.000.
Vsesojuzny Nauchno-Issledovatelsky Institut Po Razrabotke Nerazrushajuschikh Metodov I Sredsv Kon-trolya Kachestva Materialov: *See—*
Gavrev, Valery S.; Goncharuk, Jury M.; Birjukov, Sergei B.; Savitsky, Alexandr V.; and Popova, Ljudmila A., 4,187,725, Cl. 73-613.000.
W. F. Altenpohl, Inc.: *See—*
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Schroder, Rolf, 4,187,776, Cl. 100-93.00P.
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Herrig, Klaus; and Wagner, Heinz, 4,188,020, Cl. 256-45.000.
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Lavochkin, Ronald B.; and Coe, Thomas D., 4,187,711, Cl. 72-256.000.
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Northrop, Richard A., Jr.; and Wanat, David J., 4,187,683, Cl. 60-527.000.
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Ratliff, William K.; and Warman, Charles P., 4,187,940, Cl. 192-88.00A.
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Silvestrini, Richard L.; and Newton, Paul P., 4,187,939, Cl. 192-84.00C.

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Zinnes, Harold; and Schwartz, Martin L., 4,188,482, Cl. 544-32.000.
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Watson, Charles L. Combination boat and camper trailer. 4,188,056, Cl. 296-157.000.
Watson, John D. Diverter-valve apparatus. 4,187,882, Cl. 137-625.470.
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Webster, Sherwood F.; and Heise, Richard L. Intake manifold variable atomizing valve. 4,187,820, Cl. 123-141.000.
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Wehner, Wolfgang; and Wirth, Hermann O., to Ciba-Geigy Corporation. Organotin compounds. 4,188,334, Cl. 260-429.700.
Weible, Warren W., to Zeller Corporation, The. Universal joint for connecting shafts. 4,187,699, Cl. 64-12.000.
Weill, Theodore C. Wear part. 4,187,891, Cl. 144-162.00R.
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Weinstein, Berthold W.; and Willenborg, David L., to United States of America, Energy. Manipulator for rotating and examining small spheres. 4,188,118, Cl. 356-244.000.
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Weisser, Bernard: *See*—
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Wells, John L., to Zimm-Zamm Aktiengesellschaft. Tethered ball game with helix support. 4,188,033, Cl. 273-413.000.
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Werner, Nils H.: *See*—
Millgardh, Ulf J.; Lindberg, Ulf W.; Anneflod, Weimar A.; Werner, Nils H.; and Wimelius, Bjorn, 4,188,248, Cl. 156-164.000.
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Mahajan, Roop L., 4,187,974, Cl. 228-242.000.
Sherman, Charles J., 4,187,867, Cl. 134-64.00P.
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Hart, James E., 4,188,071, Cl. 303-33.000.
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Yeo, Denis, 4,188,521, Cl. 219-60.00A.
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Chasson, Leon H., 4,188,544, Cl. 250-560.000.
Whaley, Kent; and Reinart, Joseph, to Whaley, Kent. Clamping device. 4,188,023, Cl. 269-228.000.
Whaley, William L., to ACF Industries, Incorporated. Spacer carriers for floating seats in gate valves. 4,188,016, Cl. 251-328.000.
Wheaton, William H., to A. O. Smith Corporation. Pocket receptacle for securing a sensing element within electrical windings. 4,188,553, Cl. 310-68.00C.
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Hall, Lawrence G.; and Whistler, Wayne J., 4,187,856, Cl. 128-635.000.
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White, Jack M.: *See*—
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White, Jerry R.: *See*—
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White, Martin: *See*—
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White Metal Rolling & Stamping Corp.: *See*—
Larson, Clayton E., 4,187,928, Cl. 182-124.000.
Whiteside, George D.: *See*—
Biber, Conrad H.; Johnson, Bruce K.; and Whiteside, George D., 4,188,103, Cl. 354-27.000.
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Fauchier, Jess F.; Seipp, William H.; and Whiteside, Stephen E., 4,188,617, Cl. 340-183.000.
Whiteway Manufacturing Co., Inc.: *See*—
Reibling, Robert L., 4,188,657, Cl. 362-348.000.
Whyco Chromium Company, Inc.: *See*—
Hyner, Jacob; Gradowski, Steven; and Maestrone, Thomas F., 4,188,459, Cl. 428-648.000.
Wierzchowski, Dieter; Fischer, Klaus; Formanek, Gunther; and Scheumann, Leonhard, to Licentia Patent-Verwaltungs-G.m.b.H. Electronic control device for electric ranges. 4,188,528, Cl. 219-490.000.
Wiese, Larry L., to Bell Telephone Laboratories, Incorporated. Mercury-wetted relay construction. 4,188,601, Cl. 335-51.000.
Wilcox, Dwight E., to Wilcox Silent Nozzle Man, Inc. Firehose-assembly steadying device. 4,187,913, Cl. 169-51.000.
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Wilcox, Dwight E., 4,187,913, Cl. 169-51.000.
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Wilhelm, Larry A., to Midland-Ross Corporation. Apparatus and method for testing products for leaks. 4,187,717, Cl. 73-46.000.
Wilkes, Glenn R.; and Brault, Albert T., to Eastman Kodak Company. Catalytic activation of cobalt complex imaging by cobalt sulfide. 4,188,217, Cl. 430-353.000.
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Willis, Brian J.; and Yurecko, John M., Jr., to Fritzsche Dodge & Olcott Inc. Substituted cyclic alcohols, methods of preparing and compositions containing same. 4,188,310, Cl. 252-522.00R.
Willis, Don: *See*—
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Allen, Richard T.; Moyer, Rudolph H.; Sibbett, Donald J.; Anderson, Howard H.; Martner, Glen R.; and Willis, Don, 4,187,859, Cl. 128-725.000.
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Willner, Howard; and Kapteyn, Robert J., to Bio-Rad Laboratories, Inc. High density lipoprotein cholesterol assay. 4,188,188, Cl. 23-230.00B.
Wilms, Manfred W.: *See*—
Pranke, Walter T.; and Wilms, Manfred W., 4,188,561, Cl. 313-325.000.
Wilshire Bedding Co., Inc.: *See*—
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Wilson, Harry L.; Shultz, David E.; and Muntean, George L., to Cummins Engine Company, Inc. Apparatus and method for averting the effects of seal failure in an I.C. engine fuel supply system. 4,187,817, Cl. 123-139.0AW.

Wilson, Peter C.; and Hughart, Robert P. Method and apparatus for monitoring density fluctuations in material flowing spirally within a hydrocyclone. 4,188,535, Cl. 250-359.000.

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Jones, Harry S.; Kirkpatrick, David B.; and Wilson, Robert G., 4,187,779, Cl. 102-18.00M.

Wimelius, Bjorn: *See—*
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Wirth, Hermann O.: *See—*
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Wiser, J. Gordon: *See—*
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Wissel, Frank A.; and Bucher, Charles A., to Cincinnati Electronics Corporation. Synchronized receiver power system. 4,188,585, Cl. 325-492.000.

Withoos, Wilhelmus H. C.; te Raa, Gerhardus A.; and Sprengers, Johannes, to U.S. Philips Corporation. Method of manufacturing a metallized plastic reflector. 4,188,358, Cl. 264-255.000.

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Hirleman, Edwin D., Jr.; and Wittig, Sigmar L. K., 4,188,121, Cl. 356-336.000.

WOCO Franz-Josef Wolf & Co., Firma: *See—*
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Wolf, Charles B.: *See—*
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Dittrich, Jurgen; Heinzerling, Jurgen; Meijer, Dietrich E.; Mollendorf, Ralf; and Wolf, Friedrich, 4,188,640, Cl. 358-111.000.

Wolf, Peter. Board element. 4,188,428, Cl. 428-71.000.

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Patel, Jayant M.; Wolfe, Jerome K.; and Koren, Paul P., 4,188,514, Cl. 200-48.00R.
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Wong, Chia-Hsiang: *See—*
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Wood, Ernest C.: *See—*
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Wood, Prentice J., to Mead Corporation, The. Article carrier and blank therefor. 4,187,944, Cl. 206-187.000.

Woodbrey, James C.; and Moncur, Marlowe V., to Monsanto Company. Amino-functional photopolymer compositions and photo-oxidation imaging processes employing same. 4,188,223, Cl. 430-270.000.

Woods, David R.: *See—*
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Wright, Alan C.: *See—*
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Wright State University: *See—*
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Wrue, Richard J., to Bausch & Lomb Incorporated. Contact lens cleansing apparatus. 4,187,574, Cl. 15-104.920.

Wu, David C.: *See—*
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Xerox Corporation: *See—*
Lehman, Richard F., 4,188,213, Cl. 430-43.000.
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Stange, Klaus K., 4,188,110, Cl. 355-3.0BE.
Swift, Joseph A., 4,188,423, Cl. 427-444.000.

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Yama, Toshio; and Shimizu, Kazuaki, to Nissan Motor Company, Limited. Hydraulic anti-skid device. 4,188,074, Cl. 303-92.000.

Yamada-Graphics Corp.: *See—*
Yamada, Yoshikazu, 4,187,629, Cl. 40-109.000.

Yamada, Hirofumi; Takaki, Noboru; and Masuda, Michio, to Kubota, Ltd. Method for cooling aged board material. 4,187,616, Cl. 34-13.000.

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Yamada Yuki Seizo Co., Ltd.: *See—*
Ito, Jinichi, 4,188,170, Cl. 417-387.000.

Yamaguchi, Norishige; Ohya, Kazuo; Kohmoto, Osamu; and Fujishima, Hiroki, to TDK Electronics Company, Limited. Thermally stable amorphous magnetic alloy. 4,188,211, Cl. 75-170.000.

Yamaguchi, Yasumasa; and Kohno, Kazuo, to Nitto Chemical Industry Co., Ltd. Process for preparing acrylamide aqueous solution. 4,188,339, Cl. 260-561.00N.

Yamamoto, Stephen K.: *See—*
Selvin, Gerald J.; Oliver, Leland W.; Yamamoto, Stephen K.; and Hogan, Clarence V., 4,187,605, Cl. 29-629.000.

Yamamura, Toshio, to Tokyo Shibaura Electric Co., Ltd. X-ray tube. 4,188,558, Cl. 313-55.000.

Yamauchi, Kazuhisa; Tanaka, Taku; and Kawai, Syuji, to Kuraray Co., Ltd. Method and apparatus for detecting leaks in hollow fiber membrane modules. 4,188,117, Cl. 356-237.000.

Yamazaki, Masao, to Copal Company Limited. Switch means for journal paper feeding and receipt paper feeding control circuit. 4,188,138, Cl. 400-586.000.

Yan, Tsoung-Yuan, to Mobil Oil Corporation. Shaped carbon articles. 4,188,279, Cl. 204-294.000.

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Espenscheid, Wilton F.; and Yan, Tsoung-Yuan, 4,188,235, Cl. 106-278.000.

Yanagioka, Seiichi. Nickel-plated golf club shaft made of fiber-reinforced plastics. 4,188,032, Cl. 273-80.00R.

Yang, Chieh-Pang; and Wong, Chia-Hsiang. Safety indicator for automobile braking system. 4,188,613, Cl. 340-52.00A.

Yang, Yue-Chyou: *See—*
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Yates, Jan B.: *See—*
Talbert, Sherwood G.; Klausing, Thomas A.; and Yates, Jan B., 4,188,172, Cl. 417-53.000.

Yeates, Richard; Terlecky, Boris S.; and Shah, Jagdish K., to Trailer Train Company. Apparatus for machining railroad truck bolsters. 4,187,600, Cl. 29-564.000.

Yeh, Yu S.: *See—*
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Yeo, Denis, to Westinghouse Electric Corp. Apparatus for welding an end plug in a nuclear fuel tube. 4,188,521, Cl. 219-60.00A.

Yoshida, Kenichi: *See—*
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Yoshida Kogyo K K: *See—*
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Yoshida, Satoshi: *See—*
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Yoshikumi, Chikao; Omura, Yoshio; and Hotta, Tetsuya, to Burroughs Wellcome Co. Nitrogen-containing polysaccharide for promoting drug-sensitivity of bacteria resistant to antibiotics. 4,188,384, Cl. 424-180.000.

Yoshimura, Tetsuya, to Nagatanien Honpo Co., Ltd. Method of detecting defective portion of sealing. 4,187,798, Cl. 116-206.000.

Yoshino, Koichiro: *See—*
Tsukamoto, Goro; Yoshino, Koichiro; Kohno, Toshihiko; Taguchi, Masahiro; Dezawa, Katsumi; Kagaya, Hajime; Ito, Keiso; and Nose, Takashi, 4,188,486, Cl. 546-271.000.

Yoshio, Akira, to Sony Corporation. Method for producing a metal layer by plating. 4,188,240, Cl. 148-6.14R.

Yoshioka, Toshihiro; Itaya, Shikiho; Arima, Yusaku; and Tanaka, Hirokazu, to Mitsui Petrochemical Industries, Ltd.; and Catalysts & Chemical Industries. Process for catalytic vapor phase reduction of nitrogen oxides and catalyst composition used therefor. 4,188,365, Cl. 423-239.00A.

Yoshisato, Akiyuki, to Alps Electric Co., Ltd. SSB transceiver. 4,188,579, Cl. 325-17.000.

Yurecko, John M., Jr.: *See—*
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Hamma, Karlmann; Ott, Anton; Vetter, Werner; and Chatterjee, Arun, 4,187,739, Cl. 74-732.000.

Zahora, Edward, Jr.: *See—*
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Zakharov, Alexandr V.: *See—*
Bobrovnikov, Anatoly P.; Zakharov, Alexandr V.; Soloviev, Gennady I.; Mikhailov, Gennady G.; Golubeva, Tamara N.; and Glushkova, Nina N., 4,187,652, Cl. 52-90.000.

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Zarembka, Robert L., to Goodyear Aerospace Corporation. Ribbon-wrapped carbon brake disk. 4,187,932, Cl. 188-73.200.

Zebli, Roland-Detlev, to Dr. Ing. h.c. F. Porsche Aktiengesellschaft. Internal combustion engine with a bypass line skirting the load-control organ of the internal combustion engine. 4,187,821, Cl. 123-179.00G.

Zegers, Antonius P. F.; and Compen, Johannes M. A. A., to U.S. Philips Corporation. Cathode ray tube having low resistance contact area beneath high voltage contact spring. 4,188,564, Cl. 313-479.000.

Zeller Corporation, The: *See—*
Weible, Warren W., 4,187,699, Cl. 64-12.000.

Zeltzer, Lee B. Waterbed construction. 4,187,565, Cl. 5-451.000.

Ziegler, Thomas F. Impacted tooth ligation chain. 4,187,610, Cl. 433-24.000.

Ziemke, Robert A.: *See*—
Heckelman, James D.; and Ziemke, Robert A., 4,188,621, Cl. 340-528.000.

Zierdt, Gene O.: *See*—
Giordano, Francis P.; Kuhn, Lawrence; Lane, Ramon; Lee, Chen-Hsiung; and Zierdt, Gene O., 4,188,635, Cl. 346-75.000.

Zimm-Zamm Aktiengesellschaft: *See*—
Wells, John L., 4,188,033, Cl. 273-413.000.

Zink, John S.; Reed, Robert D.; and Schwartz, Robert E., to John Zink Company. Better use of gas discharge energy for smoke suppression. 4,188,183, Cl. 431-202.000.

Zinnes, Harold; and Schwartz, Martin L., to Warner-Lambert Company. Thiazino indole compounds. 4,188,482, Cl. 544-32.000.

Zurn Industries, Inc.: *See*—
Hughey, John E., 4,187,878, Cl. 137-601.000.

Zwarun, Andrew A., to Propper Manufacturing Co., Inc. Temperature indicator. 4,187,799, Cl. 116-217.000.

Zweekly, Raymond T., to Valeron Corporation, The. Indexable insert drill. 4,188,162, Cl. 408-199.000.

Zwiren, Jan M.; Casper, Selma M.; and Sinclair, Norman, to Helene Curtis Industries, Inc. Comb with rotatable teeth. 4,187,866, Cl. 132-151.000.

LIST OF REISSUE PATENTEES

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NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Buono, Dennis F.; Carlson, Nils G.; Hibner, David H.; and Moringiello, Donald C., to United Technologies Corporation. Damped intershaft bearing and stabilizer. Re. 30,210, Cl. 308-26.000.

Cameron, Robert G.; and Neuberger, Dan, to Eastman Kodak Company. Photographic elements containing color-forming couplers having an inhibiting effect upon the reactivity of competing couplers. Re. 30,211, Cl. 430-503.000.

Carder, Charles H., to Union Carbide Corporation. Coating and ink compositions. Re. 30,212, Cl. 106-20.000.

Carlson, Nils G.: *See*—
Buono, Dennis F.; Carlson, Nils G.; Hibner, David H.; and Moringiello, Donald C., Re. 30,210, Cl. 308-26.000.

Eastman Kodak Company: *See*—
Cameron, Robert G.; and Neuberger, Dan, Re. 30,211, Cl. 430-503.000.

Eaton Corporation: *See*—
McNinch, Joseph H., Jr.; Urban, John A.; and Hopkins, Gary L., Re. 30,209, Cl. 303-106.000.

Gagliani, John; and Long, John V., to International Harvester Company. Method of making foamed copolyimides and product obtained therefrom. Re. 30,213, Cl. 521-185.000.

Hibner, David H.: *See*—
Buono, Dennis F.; Carlson, Nils G.; Hibner, David H.; and Moringiello, Donald C., Re. 30,210, Cl. 308-26.000.

Hopkins, Gary L.: *See*—
McNinch, Joseph H., Jr.; Urban, John A.; and Hopkins, Gary L., Re. 30,209, Cl. 303-106.000.

International Harvester Company: *See*—
Gagliani, John; and Long, John V., Re. 30,213, Cl. 521-185.000.

Knorr-Bremse GmbH: *See*—
Pollinger, Hans; Prahl, Franz; and Schorwerth, Mathias, Re. 30,208, Cl. 188-59.000.

Long, John V.: *See*—
Gagliani, John; and Long, John V., Re. 30,213, Cl. 521-185.000.

McNinch, Joseph H., Jr.; Urban, John A.; and Hopkins, Gary L., to Eaton Corporation. Skid control system. Re. 30,209, Cl. 303-106.000.

Moringiello, Donald C.: *See*—
Buono, Dennis F.; Carlson, Nils G.; Hibner, David H.; and Moringiello, Donald C., Re. 30,210, Cl. 308-26.000.

Neuberger, Dan: *See*—
Cameron, Robert G.; and Neuberger, Dan, Re. 30,211, Cl. 430-503.000.

Pollinger, Hans; Prahl, Franz; and Schorwerth, Mathias, to Knorr-Bremse GmbH. Disc brake for railway vehicles. Re. 30,208, Cl. 188-59.000.

Prahl, Franz: *See*—
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United Technologies Corporation: *See*—
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Urban, John A.: *See*—
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Anderson, Frederic W., to Reedley Nursery, Inc. Plum tree. 4,501, 2-12-80, Cl. 38.000.

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Reedley Nursery, Inc.: *See*—
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Ball Corporation: *See*—
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Barker, Fred J. Combined toothbrush, display and charging unit therefor. 254,162, 2-12-80, Cl. D4-15.000.

Bateman, Robert F.: *See*—
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Beeman, Louis M. Stone faceting machine. 254,199, 2-12-80, Cl. D15-125.000.

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Genaro, Donald M.; Stokes, Rembert R.; and Sylvester, Gordon E., 254,195, Cl. D18-12.000.

Bird, Gayland G. Combined mixing and staining dental slab. 254,213, 2-12-80, Cl. D24-10.000.

Boston, Bob, Jr.; and Mills, Patricia. Doll or similar article. 254,205, 2-12-80, Cl. D21-185.000.

Breslow, David. Make-up mirror. 254,208, 2-12-80, Cl. D28-65.000.

Bruner, Frank D. Combined rope and terminal unit therefor. 254,160, 2-12-80, Cl. D8-349.000.

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Campbell, William B., deceased; and by Campbell, Doris, executor, to Ball Corporation. Christmas ornament. 254,190, 2-12-80, Cl. D11-127.000.

Caudill, Virgil R. Recessed reading material support. 254,158, 2-12-80, Cl. D6-130.000.

Christian, Hubert E., to Dart Industries Inc. Food storage container. 254,166, 2-12-80, Cl. D7-76.000.

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Collett, Anthony, to Colber Corporation, The. Resistor housing. 254,186, 2-12-80, Cl. D13-21.000.

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Corcoran, Gary V.; and Reed, John R. Sandal. 254,176, 2-12-80, Cl. D2-270.000.

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Croyle, Jack V.; and Bateman, Robert F., to Dart Industries Inc. Combined removable carrying handle and frame for a food storage container. 254,170, 2-12-80, Cl. D7-132.000.

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Daline, Gordon. Edible container for food. 254,159, 2-12-80, Cl. D1-3.000.

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Christian, Hubert E., 254,166, Cl. D7-76.000.
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Dolas, Michael, to Wells Fargo & Company. Belt buckle. 254,179, 2-12-80, Cl. D2-427.000.
Doodson, Peter J., to U.S. Philips Corporation. Head-phone. 254,183, 2-12-80, Cl. D14-36.000.
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Freese, Lillian M., to Freese Products Corporation. Dishwasher basket. 254,187, 2-12-80, Cl. D15-36.000.
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Genaro, Donald M.; Stokes, Rembert R.; and Sylvester, Gordon E., to Bell Telephone Laboratories, Incorporated. Sliding hideaway keyboard. 254,195, 2-12-80, Cl. D18-12.000.
Genc, Robert R.: *See*—
Soika, Emil H.; and Genc, Robert R., 254,182, Cl. D17-20.000.
Gibson, Sidney. Table. 254,164, 2-12-80, Cl. D6-175.000.
GTE Automatic Electric Laboratories Incorporated: *See*—
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Gutknecht, William L. Golfer's tool. 254,211, 2-12-80, Cl. D21-234.000.
Hardy, Gilbert F., to Wyrwa, Deana W. Segmental jewelry band. 254,198, 2-12-80, Cl. D11-4.000.
Holmberg, Roy, to Aktiebolaget Svenska Flaktfabriken. Corrugated metal sheet contact body for humidifiers. 254,207, 2-12-80, Cl. D23-146.000.
Honzyou, Hiroshi, to Sony Corporation. Wheelchair. 254,192, 2-12-80, Cl. D12-131.000.
Horback, Henry. Display stand or similar article. 254,174, 2-12-80, Cl. D6-29.000.
Ilukowicz, Robert J., to Preco Industries Ltd. Cattle slat reinforcing bar support. 254,168, 2-12-80, Cl. D8-354.000.
Intercraft Industries Corporation: *See*—
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Odom, James A. Combustion detector. 254,188, 2-12-80, Cl. D10-106.000.
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CLASS 102

18 M 4,187,779
28 R 4,187,780
38 CC 4,187,781
56 SC 4,187,782
93 4,187,783

CLASS 104

235 4,187,784

CLASS 106

1.27 4,188,227
20 Re.30,212
50 4,188,228
68 4,188,229
70 4,188,230
90 4,188,231
97 4,188,232
4,188,233
267 4,188,234
278 4,188,235
308 Q 4,188,236

CLASS 108

36 4,187,785
64 4,187,786
96 4,187,787

CLASS 112

79 R 4,187,788
158 E 4,187,789
4,187,790
265.2 4,187,791
286 4,187,792
288 4,187,793
308 4,187,794
318 4,187,795

CLASS 114

312 4,187,796

CLASS 116

87 4,187,797
206 4,187,798
217 4,187,799

CLASS 118

708 4,187,802
724 4,187,800
729 4,187,801

CLASS 119

1 4,187,803
72.5 HRC 4,187,804

CLASS 123

28 4,187,805
32 EE 4,187,806
41.34 4,187,807
48 AA 4,187,808
65 EM 4,187,809
90.16 4,187,810
119 A 4,187,811
119 EC 4,187,812
4,187,814
122 H 4,187,815
136 4,187,813
139 AW 4,187,816
4,187,817
140 R 4,187,818
141 4,187,819
4,187,820
179 G 4,187,821
179 L 4,187,822
188 M 4,187,823
198 F 4,187,824
205 4,187,825

CLASS 124

24 R 4,187,826

CLASS 125

16 R 4,187,827
18 4,187,828

CLASS 126

121 4,187,829
4,187,830
312 4,187,833
360 R 4,187,835
419 4,187,831
425 4,187,834
443 4,187,832

CLASS 128

2.08 4,187,836
32 4,187,837
76 R 4,187,838
79 4,187,839
92 E 4,187,841
92 EA 4,187,840
166 4,187,844
202.22 4,187,842
202.26 4,187,843
205.13 4,187,845
214 F 4,187,847
214 R 4,187,846
247 4,187,848
278 4,187,849
283 4,187,850
295 4,187,851
334 R 4,187,852
419 PG 4,187,854
419 PT 4,187,853
427 4,187,855
635 4,187,856
660 4,187,857
710 4,187,858
725 4,187,859
763 4,187,860
764 4,187,861

CLASS 131

15 R 4,187,862
17 R 4,187,863
242 4,187,864
250 4,187,865

CLASS 132

151 4,187,866

CLASS 134

2 4,188,237
64 P 4,187,867
184 4,187,868

CLASS 135

67 4,187,869

CLASS 136

89 FC 4,188,238
4,188,239

CLASS 137

102 4,187,870
112 4,187,871
454.6 4,187,872
505.13 4,187,873
533.11 4,187,874
576 4,187,875
594 4,187,876
596 4,187,877
601 4,187,878
4,187,879
625.17 4,187,880
625.31 4,187,881
625.47 4,187,882
625.68 4,187,883
625.69 4,187,884

CLASS 138

89 4,187,885

CLASS 139

68 4,187,886
196.2 4,187,887
435 4,187,888

CLASS 140

92.1 4,187,889

CLASS 141

27 4,187,890

CLASS 144

162 R 4,187,891

CLASS 145

50 A 4,187,892

CLASS 148

6.14 R 4,188,240
12 F 4,188,241
15.5 4,188,242
155 4,188,243
174 4,188,244
188 4,188,245

CLASS 150

8 4,187,893

CLASS 152

222 4,187,894

CLASS 156

57 4,188,246
154 4,188,247
164 4,188,248
165 4,188,249
248 4,188,251
253 4,188,250
361 4,188,252
4,188,253
382 4,188,254
384 4,188,255
386 4,188,256
504 4,188,257
628 4,188,258

CLASS 157

1.55 4,187,895

CLASS 160

121 R 4,187,896
177 4,187,897

CLASS 162

4 4,188,259
16 4,188,260
42 4,188,261
205 4,188,262

CLASS 164

421 4,187,898

CLASS 165

1 4,187,899
8 4,187,900
47 4,187,901
76 4,187,902
4,187,903
104 4,187,904
181 4,187,905

CLASS 166

120 4,187,906
254 4,187,908
275 4,187,907
284 4,187,909
305 R 4,187,910
312 4,187,911
314 4,187,912

CLASS 169

51 4,187,913

CLASS 172

53 4,187,914
59 4,187,915
146 4,187,916

CLASS 173

131 4,187,917

CLASS 174

42 4,188,502

CLASS 175

39 4,187,918
246 4,187,919
267 4,187,920
340 4,187,921
374 4,187,922

CLASS 178

88 4,188,503

CLASS 179

1 GP 4,188,504
1 PC 4,188,505
1.5 R 4,188,506
6 D 4,188,507
18 AD 4,188,509
18 DA 4,188,508
90 BD 4,188,510
99 A 4,188,511
100 C 4,188,512
111 E 4,188,513

CLASS 180

53 R 4,187,924
215 4,187,923
268 4,187,925

CLASS 181

192 4,187,926

CLASS 182

2 4,187,927
124 4,187,928
222 4,187,929

CLASS 184

1 R 4,187,930

CLASS 188

59 Re.30,208
72.1 4,187,931
73.2 4,187,932
134 4,187,933

CLASS 191

39 4,187,934

CLASS 192

4 A 4,187,935
21 4,187,936
45 4,187,937
54 4,187,938
84 C 4,187,939
88 A 4,187,940

CLASS 193

5 4,187,941

CLASS 198

345 4,187,942
730 4,187,943

CLASS 200

48 R 4,188,514
4,188,515
4,188,516
61.45 R 4,188,517
159 R 4,188,518

CLASS 204

1 R 4,188,266
1 T 4,188,267
2.1 4,188,268
32 R 4,188,269
42 4,188,270
55 R 4,188,271
149 4,188,272
158 HA 4,188,274
158 HE 4,188,273
158 R 4,188,275
159.15 4,188,224
159.17 4,188,276
190 4,188,277
268 4,188,278
294 4,188,279

CLASS 206

187 4,187,944

CLASS 208

53 4,188,280
57 4,188,281
134 4,188,282
143 4,188,283
216 PP 4,188,284
246 4,188,285

CLASS 209

168 4,188,287
273 4,188,286
310 4,188,288
592 4,187,945
674 4,187,946

CLASS 210

7 4,188,289
21 4,188,290
23 H 4,188,291
29 4,188,292
47 4,188,293
160 4,188,294
206 4,188,295
222 4,188,296

CLASS 211

13 4,187,947
71 4,187,948

CLASS 212

58 R 4,187,949

CLASS 215

6 4,187,951
247 4,187,952
301 4,187,953

CLASS 219

10.47 4,188,519
10.55 B 4,188,520
60 A 4,188,521
69 M 4,188,522
83 4,188,523
85 CM 4,188,524
125.12 4,188,525
137.8 4,188,526
202 4,188,527
490 4,188,528

CLASS 220

90.4 4,187,954
435 4,187,955
465 4,187,956

CLASS 222

1 4,187,957
57 4,187,958
94 4,187,959
107 4,187,960
133 4,187,961
173 4,187,962
402.13 4,187,963
546 4,187,964
600 4,187,965
601 4,187,966

CLASS 223

92 4,187,967

CLASS 226

4,187,968

CLASS 227

2 4,187,969
8 4,187,970
66 4,187,589
125 4,187,971

CLASS 228

20 4,187,972
4,187,973
242 4,187,974

CLASS 229

15 4,187,975
41 B 4,187,976
43 4,187,977

CLASS 232

39 4,187,978

CLASS 233

14 R 4,187,979

CLASS 235

92 DN 4,188,529
474 4,187,980
488 4,187,981

CLASS 237

2 B 4,187,982

CLASS 239

9 4,187,983
13 4,187,984
337 4,187,985
449 4,187,986
585 4,187,987
662 4,187,988

CLASS 241

2 4,187,989
30 4,187,990
33 4,187,991
65 4,187,992
89.2 4,187,993

CLASS 242

35.5 R 4,187,994
107.4 A 4,187,995
107.4 R 4,187,996
182 4,187,997
199 4,187,998

CLASS 244

12.5 4,187,999
137 P 4,188,000
151 B 4,188,001

CLASS 246

34 R 4,188,002

CLASS 248

56 4,188,003
74 PB 4,188,004
97 4,188,005
118.3 4,188,006
411 4,188,007
544 4,188,008

CLASS 249

78 4,188,009
197 4,188,010

CLASS 250

324 4,188,530
334 4,188,531
336 4,188,532
338 4,188,533
345 4,188,534
359 4,188,535
402 4,188,536
416 TV 4,188,537
423 P 4,188,538
432 PD 4,188,539
439 R 4,188,540
445 T 4,188,541
458 4,188,542
4,188,543
560 4,188,544
561 4,188,545

CLASS 251

63.4 4,188,011
173 4,188,012
175 4,188,013
196 4,188,014
315 4,188,015
328 4,188,016

CLASS 252

45 4,188,297
46.4 4,188,299
46.6 4,188,298
48.6 4,188,300
62.54 4,188,301
62.56 4,188,302
63.7 4,188,303
93 4,188,304
95 4,188,305
121 4,188,306
355 4,188,307
413 4,188,308
466 J 4,188,309
522 R 4,188,310
551 4,188,311

CLASS 254

51 4,188,017
175.3 4,188,018

CLASS 256

24 4,188,019
45 4,188,020

CLASS 260

19 EP 4,188,312
33.6 AQ 4,188,351
37 EP 4,188,313
37 PC 4,188,314
40 R 4,188,315
4,188,316
42.53 4,188,317
112 B 4,188,318
112.5 R 4,188,319
202 4,188,320
239.3 P 4,188,321
239.55 R 4,188,322
325 R 4,188,325
326.29 4,188,326
340.9 R 4,188,328
343.3 P 4,188,329
343.3 R 4,188,330
343.41 4,188,332
343.6 4,188,331
409 4,188,333
429.7 4,188,334
449 L 4,188,335
449 R 4,188,336
465 D 4,188,337
500.5 H 4,188,338
561 N 4,188,339
567.6 P 4,188,340
571 4,188,343
573 4,188,341
578 4,188,342
590 E 4,188,344
651 F 4,188,346
652 P 4,188,347

CLASS 264

1 4,188,353
22 4,188,354
26 4,188,355
40.1 4,188,356
255 4,188,358
540 4,188,357

CLASS 266

88 4,188,021
195 4,188,022

CLASS 269

228 4,188,023

CLASS 270

67 4,188,024

CLASS 271

148 4,188,026
241 4,188,027
265 4,188,028
314 4,188,025

CLASS 272

62 4,188,029
73 4,188,030

CLASS 273

26 A 4,188,031
80 R 4,188,032
248 4,188,034
260 4,188,035
265 4,188,036
413 4,188,033

CLASS 277

2 4,188,037
64 4,188,038
95 4,188,039
207 R 4,188,040

CLASS 279

75 4,188,041

CLASS 280

404 4,188,042
605 4,188,043
611 4,188,044
614 4,188,045
618 4,188,046
678 4,188,047
688 4,188,048
766 4,188,049

CLASS 285

24 4,188,050
104 4,188,051

CLASS 289

17 4,188,052
18.1 4,188,053

CLASS 290

52 4,188,546

CLASS 292

226 4,188,054

CLASS 294

1 R 4,188,055

CLASS 296

63 4,188,060
76 4,188,061
157 4,188,056
162 4,188,057
188 4,188,059
208 4,188,058

CLASS 297

61 4,188,062
273 4,188,063
367 4,188,064
440 4,188,066
442 4,188,067
485 4,188,065

CLASS 299

5 4,188,068
73 4,188,069

CLASS 303

3 4,188,070
33 4,188,071
69 4,188,072
87 4,188,073
92 4,188,074
106 Re.30,209
4,188,075

CLASS 305

29 4,188,076

CLASS 307

239 4,188,547
252 C 4,188,548
308 4,188,549
311 4,188,550
4,188,551

CLASS 308

26 Re.30,210
135 4,188,077
187 4,188,078
237 R 4,188,079

CLASS 310

13 4,188,552
68 C 4,188,553
156 4,188,554
162 4,188,555
268 4,188,556
368 4,188,557

CLASS 313

55 4,188,558
60 4,188,559
105 R 4,188,560
325 4,188,561
402 4,188,562
460 4,188,563
479 4,188,564
509 4,188,565

CLASS 315

169.4 4,188,566
396 4,188,567
411 4,188,568

CLASS 318

375 4,188,569
616 4,188,570

CLASS 322

2 R 4,188,571

CLASS 323

9 4,188,572
119 4,188,573

CLASS 324

51 4,188,574
103 R 4,188,575
163 4,188,576
220 4,188,577

CLASS 325

4 4,188,578
17 4,188,579
32 4,188,580
38 R 4,188,581
58 4,188,582
163 4,188,583
446 4,188,584
492 4,188,585

CLASS 329

192 4,188,586

CLASS 330

136 4,188,587
253 4,188,588

CLASS 331

12 4,188,589
56 4,188,590
94.5 G 4,188,592
94.5 P 4,188,591
108 D 4,188,593

CLASS 332

16 R 4,188,594

CLASS 333

113 4,188,595
151 4,188,596
165 4,188,597
207 4,188,598
219 4,188,599
228 4,188,600

CLASS 335

51 4,188,601
132 4,188,602

CLASS 336

75 4,188,603

CLASS 337

377 4,188,604

CLASS 338

32 H 4,188,605
137 4,188,606
224 4,188,607

CLASS 339

4,188,080
15 4,188,081
36 4,188,082
99 R 4,188,083
117 R 4,188,084
176 MF 4,188,086
176 MP 4,188,085

CLASS 340

52 A 4,188,613
63 4,188,614
146.1 AL 4,188,616
146.1 R 4,188,615
183 4,188,617
201 R 4,188,618
310 R 4,188,619
347 DD 4,188,620
528 4,188,621
571 4,188,622
595 4,188,623
606 4,188,624
642 4,188,625
711 4,188,626
747 4,188,627

CLASS 343

5 SA 4,188,628
6.5 R 4,188,629
9 R 4,188,630
705 4,188,631
753 4,188,632
854 4,188,633

CLASS 346

1.1 4,188,634
75 4,188,635

CLASS 350

96.20 4,188,087
96.23 4,188,088
96.34 4,188,089
174 4,188,090
201 4,188,091
214 4,188,092
303 4,188,093
337 4,188,094
357 4,188,095
358 4,188,096

CLASS 351

36 4,188,097

CLASS 352

130 4,188,098

CLASS 353

94 4,188,099
95 4,188,100
4,188,101

CLASS 354
25 4,188,102
27 4,188,103
31 4,188,104
202 4,188,105
328 4,188,107
330 4,188,106
345 4,188,108

CLASS 355
3 BE 4,188,110
3 FU 4,188,109
37 4,188,111
50 4,188,112
51 4,188,113
54 4,188,114
75 4,188,115

CLASS 356
137 4,188,116
237 4,188,117
244 4,188,118
252 4,188,119
318 4,188,120
336 4,188,121
349 4,188,122
354 4,188,123
356 4,188,124
404 4,188,125
440 4,188,126

CLASS 357
71 4,188,636
79 4,188,637

CLASS 358
4 4,188,638
25 4,188,639
111 4,188,640
190 4,188,641
213 4,188,642
280 4,188,643

CLASS 360
14 4,188,644
75 4,188,645
77 4,188,646
105 4,188,647
4,188,648
118 4,188,649
133 4,188,650

CLASS 361
322 4,188,651
402 4,188,652
405 4,188,653

CLASS 362
32 4,188,654
80 4,188,655
348 4,188,657
365 4,188,656
396 4,188,658

CLASS 363
37 4,188,659
49 4,188,660
51 4,188,661
4,188,663

CLASS 364
200 4,188,662
4,188,664
4,188,665
434 4,188,666
724 4,188,667
900 4,188,668
4,188,669

CLASS 365
49 4,188,670
149 4,188,671

CLASS 366
44 4,188,127
72 4,188,128
108 4,188,129
228 4,188,130
301 4,188,131
314 4,188,132

CLASS 367
14 4,188,610
41 4,188,611
93 4,188,608
152 4,188,609
160 4,188,612

CLASS 400
121 4,188,133
208 4,188,134
214 4,188,135
276 4,188,136
496 4,188,137
586 4,188,138
696 4,188,139

CLASS 403
13 4,188,140
24 4,188,141
31 4,188,142
49 4,188,143
104 4,188,144
112 4,188,145
158 4,188,146
230 4,188,147
258 4,188,148
271 4,188,149

CLASS 404
11 4,188,150
26 4,188,151
110 4,188,152

CLASS 405
34 4,188,153
43 4,188,154
63 4,188,155
195 4,188,156
210 4,188,157
259 4,188,158
282 4,188,159

CLASS 406
58 4,188,160

CLASS 407
25 4,188,161

CLASS 408
199 4,188,162

CLASS 409
82 4,188,163

CLASS 414
421 4,187,950
447 4,188,164
694 4,188,165
735 4,188,166
744 4,188,167
786 4,188,168

CLASS 416
185 4,188,169
226 4,188,171

CLASS 417
53 4,188,172
387 4,188,170
424 4,188,173
432 4,188,174
462 4,188,175

CLASS 418
24 4,188,176

CLASS 422
12 4,188,359
46 4,188,360

CLASS 423
9 4,188,361
22 4,188,362
4,188,363
213.2 4,188,364
239 A 4,188,365
320 4,188,366
322 4,188,367
350 4,188,368
449 4,188,369
579 4,188,370

CLASS 424
1 4,188,371
54 4,188,372
78 4,188,373
84 4,188,374
88 4,188,375
173 4,188,376
180 4,188,377
4,188,378
4,188,384
182 4,188,379
198 4,188,380
199 4,188,381
200 4,188,382
4,188,383
241 4,188,385
249 4;188,386
250 4,188,387
4,188,388
4,188,389
251 4,188,390
4,188,391
258 4,188,392
4,188,393
262 4,188,394
266 4,188,395
267 4,188,396
273 R 4,188,397
274 4,188,398
285 4,188,400
304 4,188,401
324 4,188,402
330 4,188,403
4,188,404
342 4,188,405

CLASS 425
5 4,188,177
469 4,188,178
531 4,188,179

CLASS 426
3 4,188,406
62 4,188,407
74 4,188,408
78 4,188,409
276 4,188,399
296 4,188,410
582 4,188,411
609 4,188,412

CLASS 427
30 4,188,413
40 4,188,426
45.1 4,188,414
97 4,188,415
135 4,188,416
229 4,188,417
245 4,188,418
287 4,188,419
295 4,188,420
385 A 4,188,421
444 4,188,423

CLASS 428
29 4,188,431
34 4,188,425
35 4,188,432
41 4,188,427
64 4,188,433
65 4,188,434
71 4,188,428
85 4,188,429
88 4,188,430
167 4,188,435
198 4,188,436
199 4,188,437
209 4,188,438
215 4,188,439
4,188,440
216 4,188,441
4,188,442
4,188,443
246 4,188,445
288 4,188,446
310 4,188,447
311 4,188,448
314 4,188,449
329 4,188,450
331 4,188,451
336 4,188,452
391 4,188,454
423.1 4,188,455
428 4,188,444
530 4,188,456
542 4,188,457
556 4,188,458
572 4,188,424
648 4,188,459

CLASS 429
7 4,188,460
48 4,188,461
68 4,188,462
104 4,188,463
210 4,188,464

CLASS 430
7 4,188,225
22 4,188,216
43 4,188,213
69 4,188,212
156 4,188,215
208 4,188,219
270 4,188,223
288 4,188,221
353 4,188,217
494 4,188,214
495 4,188,218
503 Re.30,211
536 4,188,220
620 4,188,226

CLASS 431
46 4,188,180
66 4,188,181
80 4,188,182
202 4,188,183

CLASS 432
13 4,188,184
27 4,188,185
43 4,188,186

CLASS 433
24 4,187,610
176 4,187,609
201 4,187,608
225 4,187,611

CLASS 435
12 4,188,465
18 4,188,466
274 4,188,467
313 4,188,265

CLASS 439
179 4,188,263

CLASS 521
185 Re.30,213

CLASS 525
187 4,188,352
232 4,188,350
366 4,188,349

CLASS 526
18 4,188,469
64 4,188,470
96 4,188,471

CLASS 528
75 4,188,472
86 4,188,473
111 4,188,474
175 4,188,475
190 4,188,476
288 4,188,477
314 4,188,478

CLASS 536
9 4,188,479
17 4,188,480

CLASS 542
426 4,188,481
429 4,188,468

CLASS 544
32 4,188,482
302 4,188,483
317 4,188,484

CLASS 546
202 4,188,485
271 4,188,486

CLASS 548
229 4,188,323
240 4,188,324
301 4,188,487
337 4,188,488
360 4,188,489

CLASS 549
87 4,188,327

CLASS 560
245 4,188,490

CLASS 562
492 4,188,491
506 4,188,492
580 4,188,493
4,188,494

CLASS 568
633 4,188,495
665 4,188,345
723 4,188,496
799 4,188,497
875 4,188,498
914 4,188,499

CLASS 585
1 4,188,500
274 4,188,348
643 4,188,501

CLASSIFICATION OF DESIGNS

D1— 3 254,159
D2— 270 254,175
254,176
254,177
427 254,179
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